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GEOLOGICAL SURVEY

Mineral resource potential of national forest RARE II and
wilderness areas in Montana

Compiled by
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This report is preliminary and has not been reviewed
for conformity with U.S. Geological Survey editorial
standards and stratigraphic nomenclature.

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INTRODUCTION

Information on the mineral resource potential of National Forest lands in Montana that are in or are being considered for inclusion in the National Wilderness Preservation System has been compiled to provide a state-wide overview. This compilation includes data from a variety of sources. Where available, the primary source has been the published reports by the U.S. Geological Survey and U.S. Bureau of Mines that were prepared in response to a provision of the Wilderness Act of 1965 requiring surveys of the mineral resources and evaluation of the mineral resource potential of lands to be included in the Wilderness System. For areas that lack such surveys, information from other published reports was evaluated, and information was supplied orally by numerous Geological Survey geologists, not all of whom have had an opportunity to review the data and conclusions presented. Any errors are the responsibility of the compilers. The following made valuable contributions: Robert L. Earhart, James E. Elliott, Jack E. Harrison, David A. Lindsey, William J. Perry, Mitchell W. Reynolds, Edward T. Ruppel, Frank S. Simons, and Russell G. Tysdal. The report has also benefited from comments by A. L. Bush and R. B. Taylor.

The areas discussed are those listed in Appendix A to a report by the U.S. Forest Service dated June 15, 1978, and entitled "Montana supplement to USDA Forest Service environmental statement, roadless area review and evaluation (RARE II)." Changes that may have been made to this list or to the boundaries of the areas since this publication were generally not known or considered here.

The report includes a text that gives a brief description of the status of work, the geology, and the mineral resource potential of each area; it also provides a list of the most pertinent references. The report also includes a 1:1,000,000-scale map (plate 1) that shows the mineral resource potential of each area by means of patterns. As shown on the map explanation, the areas have been divided into two groups. In one group are those that have had a mineral survey mandated by the Wilderness Act, and in the other group are those whose mineral potential has been determined from other geologic studies. Conclusions of mineral resource potential--both in the text and on the map--generally are stated as high, moderate, low, or unknown. Those who need more detailed information are encouraged to refer to the listed reports, as plate 1 necessarily provides only generalized information.

BEAVERHEAD NATIONAL FOREST

NORTH BIG HOLE (1-001)

(See description under Bitterroot National Forest)

WEST PIONEER (1-006)

Kind and amount of data

Mineral survey completed (Berger and others, 1983).

Mining districts, mines, and mineral occurrences

Numerous small mines and prospects are within the study area but many were inaccessible for resource evaluation. Many of the claims are currently active. The Wisdom district, which contains a few small mines, occupies the west-central part of the area. The Calvert Hill tungsten district is a few miles to the north, and the Elkhorn district is a few miles to the east of the area.

Commodities

Barite, gold, molybdenum, silver, tungsten

Mineral resource potential

Thirteen parts of the study area have been assigned a moderate or high mineral resource potential. Mineralized rocks are widespread throughout the area. Precious- and base-metal-bearing quartz veins and porphyry-type deposits are the most common types in the area. Areas of high potential include a quartz-sericite-molybdenite vein system in the northern part of the area near Lost Horse Creek, where exploration has found evidence of mineralization from the surface to considerable depth. Another area lies on the western boundary near Lake of the Woods where gold and silver occur in a quartz vein system along faults. Minor concentrations of molybdenum and tungsten and traces of bismuth also occur there. Energy resource potential is low.

References

Berger, B. R., Snee, L. W., Hanna, William, and Benham, J. R., 1983, Mineral resource potential map of the West Pioneer Wilderness Study Area, Beaverhead County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1585-A, scale 1:48,000.

EASTERN PIONEER MOUNTAINS (1-008)

Kind and amount of data

Mineral survey completed (Pearson and others, 1983).

Mining districts, mines, and mineral occurrences

Area is rimmed by six mining districts; parts of three of these extend into the area.

Commodities

Molybdenum, silver, lead, zinc, gold, copper, tungsten, phosphate.

Mineral resource potential

The area is in a highly mineralized region, and at least 10 parts of it have moderate or high mineral resource potential. The geology of the area is favorable for mineral deposits of several types. The northern part of the area contains the Black Lion molybdenum prospect, which has high potential, and favorable geology and geochemistry for the occurrence of base and precious metals and tungsten. Low grade phosphate rock is also present in the northern part. Small areas fringing the mining districts along the west, south, and southeast sides of the area have moderate resource potential. In the vicinity of Pear Lake along the southeast edge of the area there is an area of moderate potential including a molybdenum prospect. Energy resource potential is low.

References

Pearson, R. C., Berger, B. R., Kaufman, H. E., Hanna, W. F., and Zen, E-an, 1983, Mineral resource appraisal of a part of the Eastern Pioneer Mountains, Beaverhead County, Montana: U.S. Geological Survey Open-File Report 83-507.

MIDDLE MOUNTAIN-TOBACCO ROOT (1-013)
(Also in Deerlodge National Forest)

Kind and amount of data

Mineral survey of the northern half completed (O'Neill, 1983c); information on geology and mineral resources of the southern half is adequate for a preliminary mineral resource evaluation but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area contains twelve patented mining claims and 240 current unpatented claims. The area has numerous prospects and workings in the south central part. No districts are within or adjacent to the study area.

Commodities

Copper, gold, lead, molybdenum, silver, zinc.

Mineral resource potential

Several areas of moderate to high mineral resource potential are within the study area. Most of these areas are located within or adjacent to intrusive rocks of Late Cretaceous age. Disseminated and stockwork molybdenum- and copper-porphyry deposits are located in the central part of the area. Along the western edge near Boulder Lake and north from there, the area has a moderate resource potential for gold and silver, and minor amounts of copper, lead, and zinc. The Strawn mine north of Boulder Lake is an active gold mine in a silicified zone in limestone adjacent to a granite sill. Energy resource potential is low.

References

O'Neill, J. M., 1983a, Geologic map of the Middle Mountain-Tobacco Root Roadless Area, Madison County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1590-A, scale 1:50,000.

_____, 1983b, Geochemical map of the Middle Mountain-Tobacco Root Roadless Area, Madison County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1590-B, scale 1:50,000.

_____, 1983c, Mineral resource potential map of the Middle Mountain-Tobacco Root Roadless Area, Madison County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1590-C, scale 1:50,000.

O'Neill, J. M., Siems, D. F., Welsch, E. P., and Speckman, W. W., 1980, Geochemical analysis of stream sediments of the Middle Mountain-Tobacco Root Further Planning Area (RARE II), Madison County, Montana: U.S. Geological Survey Open-File Report 80-720, 6 p.

Tansley, W., Schafer, P. A., and Hart, L. H., 1933, A geological reconnaissance of the Tobacco Root Mountains, Madison County, Montana: Montana Bureau of Mines and Geology Memoir 9, 57 p.

POTOSI (1-014)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation, but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No districts, prospects, or mines are within the study area but mining is being done adjacent to the western border (see 1-013).

Commodities

None known.

Mineral resource potential

The study area has low potential for the occurrence of mineral and energy resources. Much of the area is composed of Cretaceous intrusives and Archean gneisses and schists.

References

Tansley, W., Schafer, P. A., and Hart, L. H., 1933, A geological reconnaissance of the Tobacco Root Mountains, Madison County, Montana: Montana Bureau of Mines and Geology Memoir 9, 57 p.

MADISON/JACK CREEK BASIN (1-549)
(See description under Gallatin National Forest)
(In part became Lee Metcalf Wilderness in 1983)

WEST BIG HOLE (1-943)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (E. T. Ruppel, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The southwestern edge of the study area contains many small mines and prospects but no organized district.

Commodities

Lead, silver, gold, copper.

Mineral resource potential

The western edge of the study area has a moderate resource potential for metals in several kinds of occurrences. Several mines along the border are either active or have recorded production. Base and precious metals occur in easterly-trending quartz veins in Proterozoic rocks of the Missoula group. Energy resource potential is low.

References

Geach, R. D., 1972, Mines and Mineral Deposits, Beaverhead County, Montana: Montana Bureau of Mines and Geology Bulletin 85, 194 p.

ITALIAN PEAK (1-945)
GARFIELD MOUNTAIN (1-961)

Kind and amount of data

Mineral survey completed of Italian Peak (1-945) (Lambeth and Mayerle, 1983; Skipp and others, 1983). Information on geology and mineral deposits of Garfield Mountain (1-961) is adequate for a preliminary mineral resource evaluation, but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Nicholia or Birch Creek mining district is adjacent to the west side of 1-945.

Commodities

Lead, silver, zinc.

Mineral resource potential

1-945 has a moderate resource potential for lead, silver, and zinc in stratabound deposits in the Jefferson Formation. The rocks are mainly Paleozoic sediments, Tertiary volcanics, and widespread valley fill sediments. Some Ordovician and Silurian intrusives have been thrust into the region but no mineralization was associated with these rocks. Low-grade phosphate occurrences are known, but the likelihood of production is extremely low. Energy resources are unknown, and the potential is regarded as low. 1-961 has low mineral and energy resource potential.

References

Lambeth, R. H., and Mayerle, R. T., 1983, Mineral investigations of the Italian Peak RARE II Area (No. I-1945), Beaverhead County, Montana, and Italian Peak Middle RARE II Area (No. M-4945), Clark and Lemhi Counties, Idaho: U.S. Bureau of Mines Open-File Report MLA53-83, 26 p.

Skipp, Betty, Antweiler, J. C., Kulik, D. M., Lambeth, R. H., and Mayerle, R. T., 1983, Mineral resource potential map of the Italian Peak and Italian Peak Middle Roadless Areas, Beaverhead County, Montana, and Clark and Lemhi Counties, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1601-A, scale 1:62,500.

U.S. Geological Survey, 1981 [1982], Aeromagnetic map of the Italian Peak area, Idaho and Montana: U.S. Geological Survey Open-File Report 81-1162, scale 1:62,500.

MT. JEFFERSON (1-962)

Kind and amount of data

Mineral survey completed (Witkind and others, 1981; Perry and others, 1983).

Mining districts, mines, and mineral occurrences

Just west of the study area is an abandoned coal mine and three open-pit phosphate operations; 296,000 tons of phosphate rock were produced from 1956-1958.

Commodities

None known.

Mineral resource potential

The study area has low potential for both mineral and energy resources. The area is composed chiefly of well-indurated, southward-tilted Paleozoic and Mesozoic sedimentary rocks. The area has low oil and natural gas potential (Perry and others, 1983, p. G15).

References

Martin, R. A., 1982, Geophysical survey of the Centennial Mountains Wilderness Study Area and contiguous areas, Beaverhead County, Montana, and Clark and Fremont Counties, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1342-C, scale 1:100,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Witkind, I. J., 1982, Geologic map of the Centennial Mountains Wilderness Study Area and contiguous areas, Beaverhead County, Montana, and Clark and Fremont Counties, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1342-A, scale 1:50,000.

Witkind, I. J., Huff, L. C., Ridenour, James, Conyac, M. D., and McCulloch, R. B., 1981, Mineral resource potential map of the Centennial Mountains Wilderness Study Area and contiguous areas, Idaho and Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1342-B, scale 1:50,000.

BITTERROOT NATIONAL FOREST

STONY MOUNTAIN (L1-BAD)

(See description under Lolo National Forest)

ALLAN MOUNTAIN (L1-YAG)

(Allan Mountain (4-946) is in contiguous parts of Idaho)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation (Anderson, 1960; Staatz and others, 1980).

Mining districts, mines, and mineral occurrences

Two mining districts border and extend into the area. There are a few small mines in the area.

Commodities

Monazite, niobium, columbium, thorium.

Mineral resource potential

The area has a moderate resource potential for thorium and certain rare earth elements. The geology of the area is favorable for deposits associated with several small carbonatites. There is no known geological evidence for oil, gas, coal, or geothermal resources within the area.

References

Anderson, A. L., 1960, Genetic aspects of the monazite and columbium-bearing rutile deposits in northern Lemhi County, Idaho: Economic Geology, v. 55, no. 6, p. 1179-1206.

Staatz, M. H., Hall, R. B., Macke, D. L., Armbrustmacher, T. J., and Brownfield, I. K., 1980, Thorium resources of selected regions in the United States: U.S. Geological Survey Circular 824, 32 p.

NORTH BIG HOLE (1-001)
(Also in Beaverhead National Forest)
SWIFT CREEK (1-065)
NEEDLE CREEK (1-066)

Kind and amount of data

Mineral survey completed (Elliott and others, in press; Wallace and others, 1983).

Mining districts, mines, and mineral occurrences

No mining districts exist in or adjacent to these study areas. A few prospects in the North Big Hole study area have been investigated, but there are no known prospects or occurrences in the other two areas.

Commodities

None known.

Mineral resource potential

Based on geologic, geochemical, and geophysical criteria, the areas are unfavorable for the occurrences of mineral and energy resources.

References

Bannister, D. P., Close, T. J., McColloch, R. B., and Mayerle, R. T., 1983, Mineral investigation of the Sapphires RARE II Area (No. 1421), Granite and Ravalli Counties, Montana: U.S. Bureau of Mines Open-File Report 69-83, 19 p.

Campbell, W. L., Hopkins, R. T., Lee, G. K., and Antweiler, J. C., 1983, Analytical results and sample locality map for 340 rock, 322 stream-sediment and soil, and 263 panned concentrate samples from the Sapphire Wilderness Study Area, Granite and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 83-196, 74 p.

Elliott, J. E., Wallace, C. A., O'Neill, J. M., Hanna, W. F., Rowan, L. C., Segal, D. B., Zimbelman, D. R., Pearson, R. C., Close, T. J., Federspiel, F. E., Causey, J. D., Willett, S. L., Morris, R. W., and Huffsmith, J. A., in press, Mineral resource potential map of the Anaconda-Pintlar Wilderness, Granite, Deer Lodge, Beaverhead, and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map-1633-A, scale 1:50,000.

Wallace, C. A., Lidke, D. J., Elliott, J. E., Antweiler, J. C., Campbell, W. L., Hassemer, J. H., Hanna, W. F., Bannister, D. P., and Close, T. J., 1983, Mineral resource potential map of the Sapphire Wilderness Study Area and contiguous roadless areas, Granite and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1469-B, scale 1:50,000.

Wallace, C. A., Lidke, D. J., and Obradovich, J. D., 1982, Geologic map of the Sapphire Wilderness and contiguous roadless areas, Granite and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1469-A, scale 1:50,000.

BLODGETT CANYON (1-061)
NORTH FORK LOST HORSE (1-062)
TRAPPER CREEK (1-063)
NELSON LAKE (1-064)
SELWAY-BITTERROOT CANYONS (L1-BAA)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Toth and others, 1983), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no mining districts or records of production in any of the areas. A few mines and prospects are located near the study areas, but they are relatively unimportant.

Commodities

None known.

Mineral resource potential

The areas have a low potential for the occurrence of mineral and energy resources. Most of the area is underlain by intrusive rocks of the Idaho batholith. Oil and gas potential is essentially zero (Perry and others, 1983).

References

Coxe, B. W., Mosier, E. L., and McDougal, C. M., 1982, Analyses of rocks and stream sediments from the Selway-Bitterroot Wilderness Area, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey report; available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 82-253386.

Coxe, B. W., and Toth, M. I., 1983, Geochemical maps of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-C, scale 1:125,000.

Koesterer, M. E., Bartel, A. J., Elsheimer, H. N., Baker, J. W., King, B. S., and Espos, L. F., 1982, Major-element XRF spectroscopy analyses from the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 82-1023, 36 p.

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Toth, M. I., 1983, Reconnaissance geologic map of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-B, scale 1:125,000.

Toth, M. I., Coxe, B. W., Zilka, N. T., and Hamilton, M. M., 1983, Mineral resource potential of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-A, scale 1:125,000.

Zilka, N. T., and Hamilton, M. M., 1982, Mineral investigation of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Bureau of Mines Mineral Land Assessment Report MLA 102-82, 14 p.

SAPPHIRE (1-421)

(See description under Deerlodge National Forest)

MEADOW CREEK/SELWAY-BITTERROOT WILDERNESS (1-845)
(75% in Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Toth and others, 1983), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no mining districts in or adjacent to the study area. Mines and prospects are sparse in the Montana part of the study area; however, the southwestern part, in Idaho, contains one mining district and a few scattered prospects.

Commodities

Molybdenum, cobalt, copper, silver, lead, zinc, gold.

Mineral resource potential

The part of the area that is in Montana has moderate resource potential for molybdenum; in Idaho there is a moderate potential for cobalt, copper, silver, lead, and zinc in stratabound deposits and for gold in veins. Oil and gas potential is essentially zero (Perry and others, 1983).

References

Coxe, B. W., Mosier, E. L., and McDougal, C. M., 1982, Analyses of rocks and stream sediments from the Selway-Bitterroot Wilderness Area, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey report; available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 82-253386.

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Koesterer, M. E., Bartel, A. J., Elsheimer, H. N., Baker, J. W., King, B. S., and Espos, L. F., 1982, Major-element XRF spectroscopy analyses from the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 82-1023, 36 p.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Toth, M. I., 1983, Reconnaissance Geologic Map of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-B, scale 1:125,000.

Toth, M. I., Coxe, B. W., Zilka, N. T., and Hamilton, M. M., 1983, Mineral resource potential of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-A, scale 1:125,000.

Zilka, N. T., and Hamilton, M. M., 1982, Mineral investigation of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Bureau of Mines Mineral Land Assessment Report MLA 102-82, 14 p.

BLUE JOINT (1-941)
(60% in Idaho)

Kind and amount of data

Mineral survey completed of Montana portion (Lund and others, 1983).

Mining districts, mines, and mineral occurrences

The Blue Joint district along Blue Joint Creek is the only district that extends into the study area. Numerous mines and prospects are scattered along the borders of the area.

Commodities

Barite, cobalt, copper, gold, molybdenum, silver, and uranium.

Mineral resource potential

Five areas within the study area have high mineral resource potential. The northern part of the area around the Thunderhead claim has high potential for precious metals. Sulfide minerals occur in quartz veins and breccia bodies in a broad alteration zone. The northwest border of the area has high potential for silver, gold, and molybdenum. Areas near the southeastern border have moderate to high potential for barite, cobalt, silver, and copper. Energy resources are unknown and the area's resource potential is low.

References

Lund, Karen, Rehn, W. M., and Benham, J. R., 1983, Mineral resource potential map of the Blue Joint Wilderness Study Area, Ravalli County, Montana, and the Blue Joint Roadless Area, Lemhi County, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1557-A, scale 1:50,000.

ANACONDA-PINTLAR WILDERNESS (NF-003)

Kind and amount of data

Mineral survey completed (Elliott and others, in press).

Mining districts, mines, and mineral occurrences

The Moose Lake mining district is partly within the north-central part of the area. Approximately 30 prospects and one mine are found in the area, mostly in the north-central and northeastern parts. A few prospects are located outside but near the eastern, southern, and southwestern boundaries.

Commodities

Copper, gold, lead, molybdenum, silver, tin, tungsten, zinc.

Mineral resource potential

Most of the area has low potential for mineral resources, but several areas within the wilderness have high potential. Two areas with high potential are near the Senate Mine and around Warren Peak on the northern edge, where copper, silver, lead, zinc and molybdenum occur in veins and disseminated deposits. The other areas have high potential for molybdenum, copper, silver, tungsten, and tin in stockwork, vein, skarn, and greisen deposits.

References

Elliott, J. E., Wallace, C. A., O'Neill, J. M., Hanna, W. F., Rowan, L. C., Segal, D. B., Zimbelman, D. R., Pearson, R. C., Close, T. J., Federspiel, F. E., Causey, J. D., Willett, S. L., Morris, R. W., and Huffsmith, J. A., in press, Mineral resource potential map of the Anaconda-Pintlar Wilderness, Granite, Deer Lodge, Beaverhead, and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map 1633-A, scale 1:50,000.

SELWAY-BITTERROOT WILDERNESS (NF-074)
(20% Montana; 80% Idaho)

Kind and amount of data

Mineral survey completed (Toth and others, 1983).

Mining districts, mines, and mineral occurrences

The wilderness area has 93 lode and 5 placer deposits, but no mining districts.

Commodities

Copper, lead, molybdenum, silver.

Mineral resource potential

The Cliff mine area near the northeast corner of the wilderness has a high resource potential for the occurrence of copper, lead, and silver in brecciated zones along a fault. Favorable geologic conditions and geochemistry suggest that areas of intrusive activity may have molybdenum deposits. The energy resource potential is regarded as low.

References

Coxe, B. W., Mosier, E. L., and McDougal, C. M., 1982, Analyses of rocks and stream sediments from the Selway-Bitterroot Wilderness Area, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey report; available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 82-253386.

Coxe, B. W., and Toth, M. I., 1983, Geochemical maps of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-C, scale 1:125,000.

Koesterer, M. E., Bartel, A. J., Elsheimer, H. N., Baker, J. W., King, B. S., and Espos, L. F., 1982, Major-element XRF spectroscopy analyses from the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 82-1023, 36 p.

Toth, M. I., 1983, Reconnaissance geologic map of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-B, scale 1:125,000.

Toth, M. I., Coxe, B. W., Zilka, N. T., and Hamilton, M. M., 1983, Mineral resource potential of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-A, scale 1:125,000.

Zilka, N. T., and Hamilton, M. M., 1982, Mineral investigation of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Bureau of Mines Mineral Land Assessment Report MLA 102-82, 14 p.

CUSTER NATIONAL FOREST
LOST WATER CANYON (1-362)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation, but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Study area lies within the northwestern part of the Big Horn basin, which contains numerous producing oil and gas fields. Uranium ore has been mined nearby.

Commodities

Oil, gas, uranium, limestone.

Mineral resource potential

Area has low oil and gas potential (Perry and others, 1983). Reservoir rocks and stratigraphic traps in post-Paleozoic rocks are generally absent. Uranium deposits may be present. Limestone deposits are abundant.

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

RED LODGE CREEK/HELLROARING (1-363)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Page and Jackson, 1967), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies just north and east of the Red Lodge district and southeast of the Stillwater complex. There are many active mines and claims adjacent to the study area, but nothing significant is known within the area.

Commodities

None known.

Mineral resource potential

The study area has a low mineral and energy potential. Much of the area is underlain by Precambrian granitic gneisses and Mesozoic and/or Paleozoic sedimentary rocks. No energy resources are known.

References

Page, N. J., 1979, Stillwater Complex, Montana--Structure, mineralogy, and petrology of the Basal zone with emphasis on the occurrence of sulfides: U.S. Geological Survey Professional Paper 1038.

Page, N. J., and Jackson, E. D., 1967, Preliminary report on sulfide and platinum-group minerals in the chromitites of the Stillwater Complex, Montana, in Geological Survey Research 1967: U.S. Geological Survey Professional Paper 575-D, p. D123-D126.

FISHTAIL SADDLEBACK MOUNTAIN (1-366)
NORTH ABSAROKA (1-371)
(Also in Gallatin National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Page and Jackson, 1967; Page, 1979; Segerstrom, 1980), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

A northwestern-trending mineralized zone contains many mines, prospects, and mining claims. Much recent exploration has been done by mining companies.

Commodities

Platinum group metals, nickel, chromium, copper, cobalt, iron, and arsenic.

Mineral resource potential

The northwest-trending mineralized zone has moderate to high potential for a variety of metals. The mineralized rock is within the Stillwater Complex, which contains the largest platinum-group metal resource in the U.S. and one of the largest in the world. The complex is a layered intrusion of anorthosite, gabbros, and ultramafic rocks, and is very similar to the Bushveld complex in South Africa. The metals occur as sulfides and oxides in various cumulate mafic and ultramafic layers of the intrusion. Energy resources are unknown and are considered to have low potential.

References

- Page, N. J., 1979, Stillwater Complex, Montana--Structure, mineralogy, and petrology of the Basal zone with emphasis on the occurrence of sulfides: U.S. Geological Survey Professional Paper 1038.
- Page, N. J., and Jackson, E. D., 1967, Preliminary report on sulfide and platinum-group minerals in the chromitites of the Stillwater Complex, Montana, in Geological Survey Research 1967: U.S. Geological Survey Professional Paper 575-D, p. D123-D126.
- Segerstrom, K., 1980, Preliminary geologic map of the eastern end of the upper zones of the Stillwater Complex, Stillwater County, Montana: U.S. Geological Survey Open-File Report 80-364, scale 1:62,500.
- Segerstrom, K., and Carlson, R. R., 1977, Preliminary geologic map of upper zones of the western end of the Stillwater complex, Park and Sweetgrass Counties, Montana: U.S. Geological Survey Open-File Report 77-370, scale 1:24,000.
- Segerstrom, K., and Carlson, R. R., 1979, Preliminary geologic map of the Picket Pin to Mountain View sector of the Stillwater Complex, Stillwater County, Montana: U.S. Geological Survey Open-File Report 79-656, scale 1:24,000.

COOK MOUNTAIN (1-370)
KING MOUNTAIN (1-372)
TONGUE RIVER BREAKS (1-373)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Perry and others, 1983), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Study area lies in the northern Powder River Basin in the area of the Tongue River Syncline and approximately 50 miles southeast of the Williston Basin. An abandoned strip mine is on the southern border of 1-370, and a producing gas field, Liscom Creek, lies to the north of the study areas.

Commodities

Oil, gas, coal.

Mineral resource potential

All three areas have moderate resource potential for coal (W. Culbertson, written commun., 1984), low potential for oil, and moderate potential for natural gas (Perry and others, 1983). The areas are in a structural low near the margin of the basin and contain a number of possible reservoir rocks, but petroleum source rocks are generally immature. All three areas are underlain by the Fort Union Formation that contains subbituminous coal in beds ranging from 3-30 ft thick. The areas would be favorable for large-scale strip mining.

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

LINE CREEK PLATEAU (1-911)
ROCK CREEK (1-913)

Kind and amount of data

Mineral survey completed for 1-913 (Simons and others, 1979); information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation for 1-911, but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Red Lodge mining district extends into the study areas and also into the Absaroka-Beartooth Wilderness area. Numerous prospects and mines are evident in the area, but most are in small concentrations of chromite and no larger bodies are known.

Commodities

Chromium.

Mineral resource potential

The western edge of area 1-911 and the northern half of area 1-913, which are located in the Red Lodge mining district, have areas of moderate or high resource potential for chromium. Chromite lenses occur in small bodies of serpentinite enclosed in granitic gneiss. The rest of areas 1-911 and 1-913 has a low mineral resource potential. Energy resources are unknown, and the potential is regarded as low. Patterning on plate 1 incorrectly implies that the mineral survey has been completed for area 1-911; however, the low, moderate, and high distinctions are appropriately assigned.

References

James, H. L., 1946, Chromite deposits near Red Lodge, Carbon County, Montana: U.S. Geological Survey Bulletin 945-F, 189 p.

Simons, F. S., Armbrustmacher, T. J., Van Noy, R. M., Zilka, N. T., Federspiel, F. E., and Ridenour, James, 1979, Mineral resources of the Beartooth Primitive Area and vicinity, Carbon, Park, Stillwater, and Sweet Grass Counties, Montana, and Park County, Wyoming: U.S. Geological Survey Bulletin 1391-F, 125 p.

BEARTOOTH STUDY AREA (1-912)
(See description under Gallatin National Forest)

BEARTOOTH WILDERNESS (NF-106)

Kind and amount of data

Mineral survey completed (Simons and others, 1979).

Mining districts, mines, and mineral occurrences

Four mining areas border the wilderness. The Cooke City mining district is adjacent to the southwest corner, the Red Lodge district is partly within the southeast corner, the Independence district is just to the west, and the Stillwater Complex is just to the northeast. Numerous prospects are in the wilderness near these districts.

Commodities

Gold, silver, chromium, copper, platinum-group elements.

Mineral resource potential

The wilderness has a low potential for the occurrence of mineral resources except for areas with small chromite deposits in the Red Lodge district and areas with a moderate potential for base and precious metals adjacent to the Cooke City district. The Beartooth Mountains are composed predominantly of metamorphic rocks of Precambrian age. The energy resource potential is regarded as low.

References

Simons, F. S., Armbrustmacher, T. J., Van Noy, R. M., Zilka, N. T., Federspiel, F. E., and Ridenour, James, 1979, Mineral resources of the Beartooth Primitive Area and vicinity, Carbon, Park, Stillwater, and Sweet Grass Counties, Montana, and Park County, Wyoming: U.S. Geological Survey Bulletin 1391-F, 125 p.

DEERLODGE NATIONAL FOREST

MIDDLE MOUNTAIN-TOBACCO ROOT (1-013)
(See description under Beaverhead National Forest)

SAPPHIRE (1-421)
(Also in Bitterroot National Forest)

Kind and amount of data

Mineral survey completed (Wallace and others, 1983).

Mining districts, mines, and mineral occurrences

The southeastern part of the study area is bordered by the Moose Lake district and the Senate mine area, and most of the Frogpond Basin district is included in the south-central portion of the study area. Several mines, mostly in the Frogpond Basin district, and numerous prospects are located in the study area.

Commodities

Copper, gold, lead, silver, zinc, molybdenum, tungsten.

Mineral resource potential

Resource potential is moderate or high in several parts of the area. The geology is favorable for lode and placer deposits. The Frogpond Basin district in the southern half of the area has precious- and base-metal-bearing quartz veins. Gold placers occupy drainages in and adjacent to this district. In the west-central part of the study area, a small, weakly mineralized area has moderate potential for gold, copper, and molybdenum and is a possible source for placer deposits in the surrounding drainages. Lode deposits occur along the contact of Cretaceous intrusives and Proterozoic sediments. Oil and gas potential is rated zero by Perry and others (1983).

References

- Bannister, D. P., Close, T. J., McColloch, R. B., and Mayerle, R. T., 1983, Mineral investigations of the Sapphires RARE II Area (No. 1421), Granite and Ravalli Counties, Montana: U.S. Bureau of Mines Open-File Report 69-83, 19 p.
- Campbell, W. L., Hopkins, R. T., Lee, G. K., and Antweiler, J. C., 1983, Analytical results and sample locality map for 340 rock, 322 stream-sediment and soil, and 263 panned-concentrate samples from the Sapphire Wilderness Study Area, Granite and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 83-196, 74 p.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Wallace, C. A., Lidke, D. J., Elliott, J. E., Antweiler, J. C., Campbell, W. L., Hassemer, J. H., Hanna, W. F., Bannister, D. P., and Close, T. J., 1983, Mineral resource potential map of the Sapphire Wilderness Study Area and contiguous roadless areas, Granite and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1469-B, scale 1:50,000.

Wallace, C. A., Lidke, D. J., and Obradovich, J. D., 1982, Geologic map of the Sapphire Wilderness and contiguous roadless areas, Granite and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1469-A, scale 1:50,000.

SILVER KING (1-424)
(Also in Lolo National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Alps district lies outside but is adjacent to the northwest part of the study area. Very few prospects and mines are within the study area.

Commodities

Gold, silver, copper, lead, zinc.

Mineral resource potential

A small part of the area adjacent to the Alps district has moderate to high resource potential for gold in vein and disseminated deposits in quartzite, argillite and siltite of Proterozoic age. An area along the eastern border of the study area has moderate to high potential for silver and copper in veins in Proterozoic quartzite. Oil and gas resource potential is low.

NORTH CARP (1-425 A & B)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Elliott and others, in press; James E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts, except for the southern tip of 1-425B, which was included in Elliott and others, in press.

Mining districts, mines, and mineral occurrences

Area 1-425B and the southern part of 1-425A lie within the Moose Lake mining district. One mine, the Senate mine, and one known prospect occur in area B. Area A has two known prospects.

Commodities

Copper, silver, gold.

Mineral resource potential

All of area B and much of A has moderate or high resource potential for gold, copper, and silver in veins and copper and silver in stratiform deposits. Both types of deposits are known to occur in quartzites of Precambrian age in the Moose Lake district. The remainder of area A has low potential for metallic mineral resources. Energy resource potential is low (Perry and others, 1983).

References

Elliott, J. E., Wallace, C. A., O'Neill, J. M., Hanna, W. F., Rowan, L. C., Segal, D. B., Zimbelman, D. R., Pearson, R. C., Close, T. J., Federspiel, F. E., Causey, J. D., Willett, S. L., Morris, R. W., and Huffsmith, J. A., in press, Mineral resource potential map of the Anaconda-Pintlar Wilderness, Granite, Deer Lodge, Beaverhead, and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map 1633-A, scale 1:50,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

UPPER EAST FORK (1-426)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Elliott and others, in press; Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts, except for a small part at the east end, which was included in Elliott and others, in press.

Mining districts, mines, and mineral occurrences

The Silver Lake mining district is adjacent to the eastern end of the area and several small mines and prospects are located in this part of the area. One prospect is located near the center of the area.

Commodities

Silver, gold, tungsten, copper.

Mineral resource potential

The eastern part and a small area in the central part have moderate to high resource potential for silver, tungsten, and copper in vein and replacement deposits and gold in disseminated deposits. The remainder of the area has low resource potential. The vein and replacement deposits, like those in the Silver Lake district, occur in Paleozoic carbonate rocks. A disseminated gold occurrence, in the central part of the area, is in intensely fractured Precambrian quartzite. Energy resource potential is low (Perry and others, 1983).

References

Elliott, J. E., Wallace, C. A., O'Neill, J. M., Hanna, W. F., Rowan, L. C., Segal, D. B., Zimbelman, D. R., Pearson, R. C., Close, T. J., Federspiel, F. E., Causey, J. D., Willett, S. L., Morris, R. W., and Huffsmith, J. A., in press, Mineral resource potential map of the Anaconda-Pintlar Wilderness, Granite, Deer Lodge, Beaverhead, and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map 1633-A, scale 1:50,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

STORM LAKE (1-427)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Elliott and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts, except for a small part along the southern edge that was studied by Elliott and others, in press.

Mining districts, mines, and mineral occurrences

The study area is bordered to the north by the Silver Lake district. A few small prospects extend from the district into the study area.

Commodities

Molybdenum, copper.

Mineral resource potential

The south-central part of the study area has moderate resource potential for molybdenum and copper in vein or stockwork porphyry deposits. The Mt. Howe-Mt. Evans area has moderate potential for resources of molybdenum and copper. Mineralization occurs in contact metamorphosed argillites and quartzites in contact with Tertiary-Cretaceous intrusions. Energy resource potential is low (Perry and others, 1983).

References

- Elliott, J. E., Wallace, C. A., O'Neill, J. M., Hanna, W. F., Rowan, L. C., Segal, D. B., Zimbelman, D. R., Pearson, R. C., Close, T. J., Federspiel, F. E., Causey, J. D., Willett, S. L., Morris, R. W., and Huffsmith, J. A., in press, Mineral resource potential map of the Anaconda-Pintlar Wilderness, Granite, Deer Lodge, Beaverhead, and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1633-A, scale 1:50,000.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

FLINT CREEK RANGE (1-428)

Kind and amount of data

Mineral survey completed (Ericksen and others, 1981).

Mining districts, mines, and mineral occurrences

The highly productive Philipsburg district is adjacent to the western border and the Princeton district covers part of the central portion of the study area. Numerous mines and prospects, mostly in the Princeton district, are located in the study area.

Commodities

Molybdenum, phosphate, silver, tungsten, gold, lead, zinc.

Mineral resource potential

Three areas within the study area have a high potential for a variety of commodities. The East Goat Mountain area has been explored for molybdenum deposits. The molybdenum occurs in quartz veinlets in a Cretaceous stock. In the Finley Basin-Thompson Lake areas, low-grade, possibly large skarn deposits of tungsten have been found along the contact of a Cretaceous stock. A large tonnage low-grade phosphate deposit has been explored in the south central part of the study area. Energy resource potential is low to zero (Perry and others, 1983).

References

- Emmons, W. H., and Calkins, F. C., 1913, Geology and ore deposits of the Phillipsburg Quadrangle, Montana: U.S. Geological Survey Professional Paper 78, 271 p.
- Ericksen, G. E., Leinz, R. W., and Marks, L. Y., 1981, Mineral resources of the Flint Creek Range Wilderness study area, Granite and Powell Counties, Montana: U.S. Geological Survey Open-File Report 81-1095, 6 p.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

DOLUS LAKES (1-429)

Kind and amount of data

Mineral survey completed (Elliott and others, in press).

Mining districts, mines, and mineral occurrences

The Rose Mountain district overlaps the northern boundary of the study area, and the Pioneer district is adjacent to the northeast portion of the study area. Numerous prospects occur in the northern and western parts of the study area.

Commodities

Gold, molybdenum, silver, tungsten.

Mineral resource potential

Most of the study area has a moderate or high potential for a variety of commodities. The study area is within a highly mineralized region, where geology is favorable for mineral deposits. The majority of mines and workings flank the northern border of the area and are in gold-bearing placers or gold- and silver-bearing quartz veins. The BM-COR prospect has a six-million-ton inferred molybdenum resource in a stockwork-type deposit. In the southern part of the area, mesothermal gold and silver veins and stockwork molybdenum deposits may occur. A moderate potential also exists for tungsten in skarn deposits. Energy resource potential is low to zero (Perry and others, 1983).

References

Douglas, J. K., 1973, Geophysical investigations of the Montana Lineament: University of Montana, unpublished M.S. thesis.

Elliott, J. E., Waters, M. R., Campbell, W. L., and Avery, D. W., in press, Geologic and mineral resource potential map of the Dolus Lakes Roadless Area, Granite and Powell Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1640-A, scale 1:50,000.

Ericksen, G. E., Leinz, R. W., and Marks, L. Y., 1981, Mineral resources of the Flint Creek Range Wilderness study area, Granite and Powell Counties, Montana: U.S. Geological Survey Open-File Report 81-1095, 6 p.

Lyden, C. J., 1948, The gold placers of Montana: Montana Bureau of Mines and Geology Memoir 26, 152 p.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

BASIN CREEK (1-430)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation (R. C. Pearson, oral commun., 1984).

Mining districts, mines, and mineral occurrences

Study area lies ten miles south of Butte and is adjacent to the Highland district. No mines are known in the area, but it probably contains numerous prospects.

Commodities

None known.

Mineral resource potential

Although the geologic setting is favorable, the resource potential is unknown. The area is underlain by rocks of the Boulder batholith which are favorable hosts for vein deposits nearby. Stream gravels may have potential for gold in placer deposits.

HIGHLANDS (1-431)

Kind and amount of data

In part of the area, information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (R. C. Pearson, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. In the rest of the area geologic data is limited and the mineral resource potential is unknown.

Mining districts, mines, and mineral occurrences

The study area is ringed by four significant mining districts that have produced substantial ore. Two districts, Highland and Melrose, extend slightly into the northwest part of the area. Mines and prospects are scattered throughout the area.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

The western edge of the area has moderate resource potential for silver, lead, and zinc in massive sulfide deposits, and the northern edge has moderate potential for gold in veins. Energy resource potential is low.

O'NEIL CREEK (1-432)
WHITETAIL (1-433)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two mining districts, Butte and Bigfoot, border the study areas; one extends into the eastern part of the Whitetail area. Mines and prospects are abundant in the southern and southwestern parts of the Whitetail study area.

Commodities

Lead, zinc, silver, gold, copper.

Mineral resource potential

The southern and southeastern borders of the Whitetail study area and most of the O'Neil Creek study area have a moderate resource potential for base and precious metals. These metals occur in veins within the Boulder batholith. Energy resource potential is low.

HAYSTACK (1-434)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area is bordered on the northeast side by the Boulder district and on the northwest by the Basin and Elk Park districts. It is fifteen miles northeast of Butte. Several prospects and mines are in or near the study area.

Commodities

Silver, gold, lead, zinc, copper.

Mineral resource potential

A mineralized zone with moderate to high resource potential for base and precious metals crosses the northern part of the study area. These metals occur in veins within the Boulder batholith. Energy resource potential is low.

FRED BURR (1-435)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Red Lion mining district occupies the southeastern portion of the study area. A few mines and numerous prospects are scattered across the area.

Commodities

Gold, copper, silver.

Mineral resource potential

The southeastern part of the study area has moderate resource potential for gold, copper, and silver. Deposits formed in contact zones between Cambrian carbonates and Cretaceous granodiorites. Energy resource potential is low.

References

Emmons, W. H., and Calkins, F. C., 1913, Geology and ore deposits of the Phillipsburg quadrangle, Montana: U.S. Geological Survey Professional Paper 78, 271 p.

ELECTRIC PEAK (1-609)

(See description under Helena National Forest)

ELKHORN (Bullock Hill, Casey Peak) (1-620)

(See description under Helena National Forest)

QUIGG PEAK (1-807)

(See description under Lolo National Forest)

STONY MOUNTAIN (1-808)

(See description under Lolo National Forest)

FLATHEAD NATIONAL FOREST

MT. HEFTY (1-481)

TUCHUCK (1-482)

(Also in Kootenai National Forest)

THOMPSON SETON (1-483)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation (W. J. Perry and J. E. Harrison, oral commun., 1984).

Mining districts, mines, and mineral occurrences

A proposed oil and gas well, 20 miles southeast of the study areas near Cyclone Lake, may provide valuable data for resource assessment.

Commodities

Oil and gas?

Mineral resource potential

The area has moderate resource potential for oil and gas (W. J. Perry, oral commun., 1984) based on current geologic interpretation.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

TRACTS ADJOINING BOB MARSHALL AND SCAPEGOAT WILDERNESSES (1-485)
(See description under Lewis and Clark National Forest)

SWAN RIVER ISLAND (L1-FAA)

MISSION MOUNTAIN ADDITIONS (1-500, 1-501, 1-502, 1-503, 1-504, 1-505, 1-506)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, 1969), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no mining districts or prospects within or adjacent to the study area.

Commodities

None known.

Mineral resource potential

Area has low potential for mineral deposits. Rocks in the area are almost entirely metasedimentary strata of the Missoula Group of the Belt Supergroup. Energy resources have not been found, and energy resource potential is regarded as low.

References

Harrison, J. E., Reynolds, M. W., Kleinkopf, M. D., and Pattee, E. C., 1969, Mineral resources of the Mission Mountains Primitive Area, Missoula and Lake Counties, Montana: U.S. Geological Survey Bulletin 1261-D, 48 p.

LE BEAU (1-507)
TALLY LAKE (1-511)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Harrison, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None within the areas, but small workings to the southwest of (1-511) and northwest of (1-507).

Commodities

Traces of copper.

Mineral resource potential

The areas are underlain by the Empire and Helena Formations of the Belt Supergroup. Although the Empire Formation has traces of stratabound copper, areas underlain by this formation have low resource potential. An oil and gas well drilled just to the west of the Tally Lake area was dry; the oil and gas potential is low.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

EASTSHORE (1-508)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

Copper, silver.

Mineral resource potential

The northeastern part of the study area has a moderate potential for copper and silver in stratabound deposits. Mineralization occurs in argillites and siltites of the middle Burke Formation and the upper Spokane Formation of the Belt Supergroup. No energy resources are known.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-F, scale 1:250,000.

GRUBB MOUNTAIN (1-509)
(Also in Kootenai National Forest)
GRIFFIN (1-510)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Harrison, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Small prospects in the Prichard Formation within the areas have been drilled and explored by Molycorp recently. The areas are not within or near a mining district.

Commodities

None known.

Mineral resource potential

These areas have low resource potential. The geology is unfavorable for the occurrence of mineral deposits. No energy resources are known.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

MISSION MOUNTAINS WILDERNESS (NF-050)

Kind and amount of data

Mineral survey completed (Harrison and others, 1969).

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

Although strata-bound deposits of copper and silver are known in similar rocks of the Belt Supergroup in the surrounding region, only scattered mineral occurrences (of no economic importance) were found in the area. The mineral and energy resource potential is low.

References

Harrison, J. E., Reynolds, M. W., Kleinkopf, M. D., and Pattee, E. C., 1969, Mineral resources of the Mission Mountains Primitive Area, Missoula and Lake Counties, Montana: U.S. Geological Survey Bulletin 1261-D, 48 p.

GALLATIN NATIONAL FOREST

NORTH ABSAROKA (1-371)

(See description under Custer National Forest)

NORTH ABSAROKAS (1-371A)

REPUBLIC MOUNTAIN (1-545)

BEARTOOTH STUDY AREA (1-912)

(Also in Custer National Forest)

REEF MOUNTAIN (1-914)

Kind and amount of data

Mineral survey completed (Simons and others, 1979).

Mining districts, mines, and mineral occurrences

Parts of all of the study areas lie within the Goose Lake mineralized area or Cooke City districts. Mines and prospects are numerous in and adjacent to these areas.

Commodities

Copper, silver, gold, platinum group elements, lead, zinc, molybdenum.

Mineral resource potential

A substantial part of the study areas has high mineral resource potential for a variety of commodities. In the Goose Lake area, metals occur in stockwork veins and breccia zones in a syenite stock which intrudes Precambrian granitic gneiss and metadolerite. In the Cooke City district a variety of deposits are present, including porphyry, skarn, replacement-veins, and breccia pipes. Energy resources are unknown; oil and gas resources are assigned a zero to low potential (Perry and others, 1983).

References

Lovering, T. S., 1929, The New World or Cooke City mining district, Park County, Montana: U.S. Geological Survey Bulletin 811-A, p. 1-88.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Simons, F. S., Armbrustmacher, T. J., Van Noy, R. M., Zilka, N. T., Federspiel, F. E., and Ridenour, James, 1979, Mineral resources of the Beartooth Primitive Area and vicinity, Carbon, Park, Stillwater, and Sweet Grass Counties, Montana, and Park County, Wyoming: U.S. Geological Survey Bulletin 1391-F, 125 p.

CRAZY MOUNTAINS (1-541)
(See description under Lewis and Clark National Forest)

BRIDGER RANGE (1-543)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

Mineral deposits are unknown, the geology is unfavorable, and the resource potential is low. No energy resources have been found, and the area is considered to have low potential.

NORTH ABSAROKA/CHICO PEAK (1-547A,B,C)

Kind and amount of data

Mineral survey completed (Elliott and others, 1983).

Mining districts, mines, and mineral occurrences

The study area is bordered by parts of seven mining districts and subdistricts; 3,500 lode claims and 580 placer claims have been recorded in the study area along with numerous other claims and prospects adjacent to the area.

Commodities

Copper, platinum group metals, nickel, gold, chromium, silver, molybdenum, tungsten, lead, zinc.

Mineral resource potential

Four regions within the study area are extensively mineralized and have moderate or high resource potential for several commodities. The north-northeastern (1-547A) part of the study area borders part of the Stillwater Complex that contains stratiform magmatic deposits of chromium, nickel, copper, and platinum group metals. To the west (1-547B), the Emigrant-Mill Creek area has moderate or high resource potential for copper and molybdenum in porphyry-type deposits. Sulfides occur in Tertiary igneous rocks with zonation of metals and alteration facies. To the south, the Sheepeater (Jardine) mining district extends into the area (1-547C); it has moderate resource potential. Gold-tungsten-arsenic stratabound deposits are related to Archean banded ironstone and carbonaceous metasedimentary rocks. Oil and gas resources are unknown, and their potential is regarded as low. Part of 1-547C is within the Corwin Springs Known Geothermal Resource Area (KGRA), and hence that part may have geothermal resource potential.

References

- Elliott, J. E., Gaskill, D. L., Raymond, W. H., and Peterson, D. L., 1983, Chapter A--Geological, geochemical, and geophysical investigations of the North Absaroka study area, Park and Sweet Grass Counties, Montana, in Mineral Resources of the North Absaroka study area, Park and Sweet Grass Counties, Montana: U.S. Geological Survey Bulletin 1505, 251 p.
- Hallager, W. S., 1982, Geology of an Archean stratiform gold deposit near Jardine, Montana [abs.]: Proceedings of Symposium on the genesis of Rocky Mountain ore deposits by Denver Region Exploration Geologists Society, November 4-5, Denver, Colorado.
- Seager, G. F., 1944, Gold, arsenic, and tungsten deposits of the Jardine-Crevasse Mountain district, Park County, Montana: Montana Bureau of Mines and Geology Memoir 23, 111 p.

Simons, F. S., Armbrustmacher, T. J., Van Noy, R. M., Zilka, N. T., Federspiel, F. E., and Ridenour, James, 1979, Mineral resources of the Beartooth Primitive Area and vicinity, Carbon, Park, Stillwater, and Sweet Grass Counties, Montana, and Park County, Wyoming, with a section on Interpretation of aeromagnetic data, by L. A. Anderson: U.S. Geological Survey Bulletin 1391-F, 125 p.

Stotelmeyer, R. B., Johnson, F. L., Lindsey, D. S., Ridenour, James, and Schmauch, S. W., 1983, Chapter B--Economic appraisal of the North Absaroka study area, Park and Sweet Grass Counties, Montana, in Mineral resources of the North Absaroka study area, Park and Sweet Grass Counties, Montana: U.S. Geological Survey Bulletin 1505 (in press).

Wedow, Helmuth, Jr., Gaskill, D. L., Banister, D. P., and Pattee, E. C., 1975, Mineral resources of the Absaroka Primitive Area and vicinity, Park and Sweet Grass Counties, Montana, with a section on Interpretation of geophysical data, by D. L. Peterson: U.S. Geological Survey Bulletin 1391-B, 115 p.

GALLATIN DIVIDE (1-548)
HYALITE

Kind and amount of data

Mineral survey completed (Simons and others, 1983) for all but the northern part of the area.

Mining districts, mines, and mineral occurrences

No mining districts, mines, or prospects are present in the study area. Mines and prospects that are present adjacent to the western edge of the study area have low potential. Phosphate rock is present.

Commodities

Phosphate.

Mineral resource potential

A moderate or high resource potential for phosphate exists in the southwest part of the area. However, the phosphate beds are thin, discontinuous, low grade, and in most cases deeply buried. The northern part of the area has inadequate information on geology and mineral deposits and cannot be evaluated. Energy resources are unknown, and the area has a low to zero potential for oil and gas (Perry and others, 1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Simons, F. S., Van Loenen, R. E., Moore, S. L., Close, T. J., Causey, J. D., Willett, S. L., and Rumsey, C. M., 1983, Mineral resource potential map of the Gallatin Divide Roadless Area, Gallatin and Park Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1569-A, scale 1:126,720.

MADISON/JACK CREEK BASIN (1-549)
(Also in Beaverhead National Forest)
(In part became Lee Metcalf Wilderness in 1983)

Kind and amount of data

Mineral survey completed (Becraft and others, 1970; Simons and others, 1983).

Mining districts, mines, and mineral occurrences

Several small mining districts and mineral deposits adjoin or are adjacent to the study area. There is no record of mineral production and no active mining claims exist.

Commodities

Phosphate, sillimanite, copper, silver, titanium, oil, gas, molybdenum, lead, zinc, uranium, asbestos.

Mineral resource potential

The study area contains several occurrences of the listed commodities and one area of moderate oil potential and moderate to high gas potential. Phosphate rock occurs in many parts of the area. Most of the phosphate is buried deeply due to the steep dip of the formations and faulting. The Placer Creek deposit in the northern part of the study area contains sillimanite and rutile. In the southern part of the area, copper and silver occur in an area that has been explored extensively. On the far east side of the area, the Karst asbestos mine contains a moderate amount of anthophyllite asbestos. Along the southwestern border, there is a moderate potential for oil and gas.

References

Becraft, G. E., Kiilsgaard, T. H., and Van Noy, R. M., 1970, Mineral resources of the Jack Creek basin, Madison County, Montana: U.S. Geological Survey Bulletin 1319-B, 24 p.

Lambeth, R. H., Schmauch, S. W., Mayerle, R. T., and Hamilton, M. W., 1982, Mineral investigations of the Madison RARE II Areas (No. 1549, Parts E, J, N, R, and S), Madison and Gallatin Counties, Montana: U.S. Bureau of Mines Open-File Report MLA 81-82, 32 p.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Simons, F. S., Tysdal, R. G., Van Loenen, R. E., Lambeth, R. H., Schmauch, S. W., Mayerle, R. T., and Hamilton, M. M., 1983, Mineral resource potential map of the Madison Roadless Area, Gallatin and Madison Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1605-A, scale 1:96,000.

Swanson, R. W., 1970, Mineral resources in Permian rocks of southwest Montana: U.S. Geological Survey Professional Paper 313-E, p. 661-777.

DRY CANYON (1-550)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The study area has an unknown potential.

BOX CANYON (1-742)

(See description under Lewis and Clark National Forest)

LIONHEAD (1-963)
(50% in Idaho, 4-963)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation only for part of the area (R. G. Tysdal, oral commun., 1984), but is nowhere sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

Phosphate.

Mineral resource potential

In Montana, the southern part of the study area has a low potential for phosphate, but the potential of the northern part is unknown. No geological evidence for oil, gas, coal, or geothermal resources is recognized within the area; it is assigned a zero to low oil and gas potential by Perry and others (1983). The mineral resource potential is unknown for most of the area.

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Witkind, I. J., 1972, Geologic map of Henrys Lake quadrangle, Idaho and Montana: U.S. Geological Survey Miscellaneous Investigations Map I-781-A, scale 1:65,500.

SPANISH PEAKS PRIMITIVE AREA (NF-920)

Kind and amount of data

Mineral survey completed (Becraft and others, 1966).

Mining districts, mines, and mineral occurrences

Twenty-five mining claims are located within the primitive area, but no minerals have been produced.

Commodities

Chromium, asbestos.

Mineral resource potential

The area has low mineral and energy resource potential. Chromium and amphibole asbestos are known, but the only deposit of these minerals is small and low in grade. The area is composed of Precambrian metamorphic and Paleozoic-Mesozoic sedimentary rocks.

References

Becraft, G. E., Calkins, J. A., Pattee, E. C., Weldin, R. D., and Roche, J. M., 1966, Mineral resources of the Spanish Peaks Primitive Area, Montana: U.S. Geological Survey Bulletin 1230-B, 45 p.

HELENA NATIONAL FOREST

TRACTS ADJOINING BOB MARSHALL AND SCAPEGOAT WILDERNESSES (1-485)
(See description under Lewis and Clark National Forest)

LINCOLN GULCH (1-601)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Part of the Lincoln Gulch district extends into the southeastern part of the study area. It contains several mines and prospects.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

A small part of the study area has moderate to high potential for metals in placer and lode deposits. Placer gold deposits occur in Quaternary gravels in Lincoln Gulch and vein deposits are found in the Helena Formation of Proterozoic age. Energy resource potential is low.

ANACONDA HILL (1-602)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Part of the Heddleston district is in the study area along the northwest boundary. Several mines and prospects are scattered throughout the study area.

Commodities

Copper, silver, molybdenum.

Mineral resource potential

A moderate to high resource potential exists in most of the study area. Occurrences of stratabound copper and silver are present in the Spokane Formation of the Belt Supergroup in much of the area. Energy resources are unknown and the resource potential is probably low.

References

Earhart, R. L., and Mudge, M. R., 1979, Geological map of the Choteau 1° by 2° quadrangle, Lewis and Clark, Teton, Powell, Missoula, Lake, Flathead, and Cascade Counties, Montana: U.S. Geological Survey Open-File Report 79-280, scale 1:250,000.

SPECIMEN CREEK (1-603)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun, 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two mining districts lie adjacent to or within the study area. The Heddleston district lies to the north of the area and partially extends into the area.

Commodities

Gold, silver, lead, copper, zinc.

Mineral resource potential

Two areas within the study area have moderate to high mineral resource potential. The southwestern tip contains vein deposits in Precambrian sediments in contact with granodiorite stocks. In the northeastern corner of the study area there is a moderate potential for copper and silver in stratabound deposits within the Spokane Formation of the Belt Supergroup. Energy resource potential is low.

CRATER MOUNTAIN (1-604)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two mining districts surround and partially extend into the study area on the southeastern border. Numerous prospects and mines are scattered throughout the area.

Commodities

Gold, silver, lead, copper, zinc.

Mineral resource potential

Much of the area has moderate to high potential for the occurrence of a variety of commodities. Base and precious metals occur in veins in Precambrian sediments in contact with Tertiary-Cretaceous granodiorite stocks and in Tertiary volcanic rocks. Energy resource potential is low.

OGDEN MOUNTAIN (1-605)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Big Blackfoot district extends into the southwestern corner of the study area. It contains significant mines and prospects found mostly along the southwestern edge of the study area.

Commodities

Lead, gold, silver, zinc, copper.

Mineral resource potential

The southwestern corner of the study area has moderate to high potential for mineral deposits. Base and precious metals occur in veins along the contact of the Dalton Mountain stock and Precambrian carbonate rocks. Energy resources are unknown and regarded as of low potential.

NEVADA MOUNTAIN (1-606)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Four mining districts are adjacent to or are partly within the study area. The Ophir district borders the area to the south, the McClellan district is in the northern part of the area, and the Gould-Stemple district is adjacent to the northeastern part of the area. Several mines and prospects are located within the area.

Commodities

Silver, gold, copper, lead, zinc, tungsten.

Mineral resource potential

Parts of the study area have moderate to high potential for gold in placer deposits and silver, gold, copper, lead, zinc, and tungsten in lode deposits. Placer deposits may occur in drainages along the north and south boundaries of the study area in Quaternary and Tertiary gravels. Skarn, vein, and replacement deposits are mostly at or near contacts between Cretaceous intrusives and Precambrian and Paleozoic sediments. Energy resource potential is low. The southeast part of the area is within a Known Geothermal Resource Area (KGRA), and hence that part may have a geothermal resource potential.

JERICO MOUNTAIN (1-607)
LAZYMEN GULCH (1-608)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study areas are adjacent to three significant mining districts: the Rimini and Clancy-Lump Gulch districts lie to the south of 1-608 and the Helena district lies to the east. Southwest and southeast of 1-607 are the Elliston and Rimini districts. A few prospects occur within and adjacent to the study areas.

Commodities

Silver, gold, lead, zinc, copper.

Mineral resource potential

The southern parts of the study areas include a highly mineralized zone with moderate to high potential for base and precious metals in a variety of deposit types. The metals occur in veins and disseminated zones in Cretaceous plutonic and volcanic rocks. Energy resource potential is low.

ELECTRIC PEAK (1-609)
(Also in Deerlodge National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Three districts are adjacent to or partly within the study area. The Zosell district to the west and the Basin district to the southwest adjoin or are within the study area. The Elliston district is partly within the northwest portion of the study area.

Commodities

Gold, silver, lead, zinc, copper.

Mineral resource potential

A moderate to high mineral resource potential is assigned to most of the study area. Base and precious metals occur in veins and disseminated deposits within Tertiary and Cretaceous volcanic rocks and in Cretaceous granite. Energy resource potential is low.

BIG LOG (1-610)

Kind and amount of data

For most of the area, information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Reynolds and Close, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. Part of the area is discussed by Reynolds and Close (in press).

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The potential for mineral and energy resources in the study area is low. The geology consists of a sequence of rocks ranging in age from Proterozoic to Cretaceous that show low-grade metamorphism. The potential for hydrocarbon traps in this area is low to zero because trapping structures are open to the surface and there are higher levels of thermal maturity than is normal for oil generation (Perry and others, 1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Reynolds, M. W., and Close, R. J., in press, Mineral resource potential map of the Gates of the Mountains Wilderness, Lewis and Clark County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1642-A.

DEVILS TOWER (1-611)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The area has geology unfavorable for mineral occurrences, and therefore it is assigned a low potential. Bedrock is the Belt Supergroup with a few thin Paleocene dikes that have been used for building stone. Energy resources have not been found, and their resource potential is regarded as low.

MIDDLEMAN MOUNTAIN (1-612)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Pardee and Schrader, 1933), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies just to the north of the York district. Prospects and workings are scattered throughout and one mine on the southern tip was a significant producer in the early 1920's.

Commodities

Gold.

Mineral resource potential

A small region on the southern edge of the study area has a moderate to high resource potential for gold in vein deposits. Although much of the area has been worked by old methods, possibilities remain using new methods of exploration and mining. The rocks are highly deformed; deposits are replacements and veins in diorite dikes, and in small quartz veins that extend out into shale hosts.

References

Pardee, J. T., and Schrader, F. C., 1933, Metalliferous deposits of the Greater Helena Mining Region, Montana: U.S. Geological Survey Bulletin 842, 318 p.

HEDGES MOUNTAIN (1-613)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Mertie and others, 1951; M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies within or adjacent to the York district to the east. Several small mines and workings located throughout the area have recorded production.

Commodities

Copper, silver, gold

Mineral resource potential

Along the western border of the study area there is a moderate to high resource potential for gold. The Old Amber and Daisy Lode mines are located within the mineralized area and buried deposits may exist. Mineralization followed the contact of the Greyson and Spokane formations where they were in contact with diorite dikes. Energy resources are unknown; the energy resource potential of the area is regarded as low.

References

Mertie, Jr., J. B., Fischer, R. P., and Hobbs, S. W., 1951, Geology of the Canyon Ferry quadrangle, Montana: U.S. Geological Survey Bulletin 972, 97 p.

HELLGATE GULCH (1-614)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Mertie and others, 1951; M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The area is bordered to the north by the York district and contains many small prospects and workings in Hellgate Gulch and surrounding gulches. The Argo mine lies on the northern edge of the area and was productive in the early 1900's.

Commodities

Copper, silver, gold, barite.

Mineral resource potential

The study area contains one small mineralized zone that has a moderate potential for a variety of commodities. The Argo mine is located at the north end of the zone and has recorded copper production. Mineralization occurs in a highly deformed thrust zone along the contacts of the Spokane and Empire Formations and the Greyson and Spokane Formations of the Belt Supergroup. Energy resources are unknown, and the area is assigned low resource potential.

References

Mertie, Jr., J. B., Fisher, R. P., and Hobbs, S. W., 1951, Geology of the Canyon Ferry quadrangle, Montana: U.S. Geological Survey Bulletin 972, 97 p.

CAYLSE MOUNTAIN (1-615)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies just to the east of the York district and to the north of the Confederate Gulch district. There are several prospects and claims within and adjacent to the study area.

Commodities

Gold, copper, silver.

Mineral resource potential

The southeastern tip (Norris Hill area) of the study area has moderate to high potential for gold. Mineralization was localized by contacts between diorite dikes and Proterozoic sediments. Energy resources have not been found; the energy resource potential is regarded as low.

References

Pardee, J. T., and Schrader, F. L., 1933, Metalliferous deposits of the Greater Helena Mining Region, Montana: U.S. Geological Survey Bulletin 842, 318 p.

CAMAS CREEK (1-616)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation only for a small part of the area (M. W. Reynolds, oral commun., 1984); it is nowhere sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Confederate Gulch district lies to the northwest of the study area and includes the northwestern edge of the area. Many small prospects and claims are found in the surrounding gulches.

Commodities

Gold.

Mineral resource potential

The study area contains two areas with moderate to high resource potential for gold. The northwestern area near Confederate Gulch has both placer and lode deposits. The lode deposits occur as small veins along fractures in diorite in contact with shales. The southern tip of the study area has similar lode deposits. The central part of the area has inadequate information for a resource evaluation. No energy resources are known, and the energy resource potential is regarded as low.

References

Pardee, J. T., and Schrader, F. C., 1933, Metalliferous deposits of the Greater Helena Mining Region, Montana: U.S. Geological Survey Bulletin 842, 318 p.

MOUNT BALDY (1-617)
GRASSY MOUNTAIN (1-618)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation for part of area 1-617 and all of 1-618 (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The northwestern part of area 1-617 has low potential for mineral and energy resources. The remaining one-third has not been thoroughly studied and its resource potential is unknown. The mineral resource potential of 1-618 is low.

References

Nelson, W. H., 1963, Geology of the Duck Creek Pass quadrangle, Montana: U.S. Geological Survey Bulletin 1121-J, 56 p.

ELLIS CANYON (1-619)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The area has a low resource potential for mineral and energy resources. It contains lower to middle Paleozoic rocks but no intrusive igneous rocks.

ELKHORN (1-620)
(Bullock Hill, Casey Peak)
(Also in Deerlodge National Forest)

Kind and amount of data

Mineral survey completed (U.S. Geological Survey and U.S. Bureau of Mines, 1978).

Mining districts, mines, and mineral occurrences

About 1,100 lode claims and 275 placer claims have been located in the area. Many have recorded significant production.

Commodities

Copper, gold, lead, molybdenum, silver, zinc.

Mineral resource potential

Four areas within the study area have moderate or high potential for a variety of commodities. A mineralized zone, trending northeast, has identified resources of gold, silver and copper in replacement deposits in and around Cretaceous volcanics. Several mines--Park, Callahan, Ballard and Elkhorn mines--have records of significant production; there is a moderate resource potential for copper and molybdenum in a porphyry-type deposit along this zone. Favorable geology and geochemistry all point to the probability of additional deposits within the area. The western border of the area is assigned a moderate potential for copper and molybdenum on the basis of geologic data, including studies of hydrothermal alteration and exploratory drilling. Energy resources are unknown; petroleum potential is rated zero by Perry and others (1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

U.S. Geological Survey and U.S. Bureau of Mines, 1978, Mineral resources of the Elkhorn Wilderness study area, Montana: U.S. Geological Survey Open-File Report 78-325, 342 p.

GATES OF THE MOUNTAINS WILDERNESS (NF-027)

Kind and amount of data

Mineral survey completed (Reynolds and others, in press).

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

Area holds little promise for the occurrence of mineral deposits. The area consists of rocks that range in age from Proterozoic to Cretaceous. Energy resources are unknown; oil and gas potential is rated zero to low by Perry and others (1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Reynolds, M. W., and Close, R. J., in press, Mineral resource potential map of the Gates of the Mountains Wilderness, Lewis and Clark County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1642-A.

KOOTENAI NATIONAL FOREST

McGREGOR THOMPSON (L1-LAQ)
(Also in Lolo National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a,b,c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no districts within the area and no important prospects or mines.

Commodities

Copper, silver, lead, zinc.

Mineral resource potential

The area has moderate resource potential for metals in stratabound and mesothermal vein deposits. At the northwestern edge of the area, a favorable stratigraphic zone within the middle Burke Formation (Proterozoic) locally hosts copper-silver stratabound deposits. The mesothermal veins are in a highly fractured and faulted zone extending through the central part of the area. No energy resources have been found, and the area is assigned low potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

_____ in press, b, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-F, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

MAPLE PEAK (1-141)
(95% in Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Study area lies northeast of the Coeur d'Alene district and no known prospects or mines have been investigated in the area.

Commodities

Copper, silver.

Mineral resource potential

The eastern edge of the study area has moderate resource potential for silver and copper in stratabound deposits, which may occur within quartzite beds of the Revett Formation (Proterozoic). No energy resources are known; the area is regarded as having low energy resource potential.

References

Harrison, J. E., Leach, D. L., Kleinkopf, M. D., and Long, C. L., in press, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-F, scale 1:250,000.

TUCHUCK (1-482)

(See description under Flathead National Forest)

TRACTS ADJOINING BOB MARSHALL AND SCAPEGOAT WILDERNESSES (1-485)

(See description under Lewis and Clark National Forest)

GRUBB MOUNTAIN (1-509)

(See description under Flathead National Forest)

BUCKHORN RIDGE (1-661)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (E. R. Cressman, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The study area has low potential for both mineral and energy resources. The area is underlain by the Prichard(?) Formation of Proterozoic age, but the stratigraphic zone favorable for stratabound copper and silver deposits is lacking.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

SCOTCHMAN PEAK (1-662)
(1/3 in Idaho, 2/3 in Montana)
BERRAY MOUNTAIN (1-672)

Kind and amount of data

Mineral survey completed for most of area 1-662 (Earhart and others, 1981); information inadequate for area 1-672.

Mining districts, mines, and mineral occurrences

Approximately 439 mining claims are in or adjacent to the area. Mines just south of the area have produced several hundred thousand tons of ore. The large Spar Lake mine is two miles northeast of the area.

Commodities

Copper, silver, lead, zinc.

Mineral resource potential

The eastern half of area 1-662 has moderate resource potential for copper and silver in stratabound and vein deposits. The stratabound copper-silver deposits occur in quartzite beds of the lower Revett Formation of the Belt Supergroup. Quartz veins are widespread throughout favorable zones in the Revett Formation. Several of the deposits in the area have been explored. The far eastern edge of area 1-662 and all of area 1-672 lack adequate information for evaluation.

References

Earhart, R. L., Kleinkopf, M. D., Wilson, D. M., Grimes, D. J., and Zilka, N. T., 1981, Mineral resources of the Scotchman Peak Wilderness study area, Lincoln and Sanders Counties, Montana, and Bonner County, Idaho: U.S. Geological Survey Bulletin 1467, 73 p.

NORTHWEST PEAK (1-663)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (E. R. Cressman, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

Minor amounts of stratabound copper.

Mineral resource potential

The area has low mineral and energy resource potential. Although the Prichard Formation of the Belt Supergroup is present in the study area, and stratabound deposits are present in this formation in other areas, a low resource potential is believed present here. There is a low to zero potential for oil and gas in the area.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

TROUT CREEK (1-664)
(80% Montana; 20% Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a,b,c,d), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies just to the north of the Coeur d'Alene mining district and has scattered silver prospects and placer gold deposits within it. South of the study area, many mines and prospect workings are associated with the Coeur d'Alene district.

Commodities

Copper, silver, gold, lead, zinc.

Mineral resource potential

The study area has moderate resource potential for base and precious metals in a variety of deposit types. The Revett Formation lies within the central part of the study area and contains a stratigraphic zone favorable for the occurrence of stratabound copper and silver deposits. The southern part of the study area has a geologic setting in the Prichard Formation favorable for the occurrence of Sullivan-type stratabound silver, lead, and zinc deposits. Small placer deposits are along the east fork of Trout Creek. The entire area has moderate potential for base and precious metals in mesothermal veins. The energy resource potential is low.

References

Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, a, Resource appraisal map for Sullivan-type stratabound lead-zinc-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-G, scale 1:250,000.

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, b, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

_____ in press, c, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-F, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, d, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

CATARACT (1-665)
(Also in Lolo National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a,b,c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No major districts are within or surrounding the study area. Several lode silver and placer gold prospects are scattered throughout the area with a record of past production.

Commodities

Gold, silver, lead, zinc, copper.

Mineral resource potential

The study area has moderate to high resource potential for base and precious metals in stratabound, mesothermal vein and placer deposits. A stratigraphic zone in the Revett Formation, on the southeastern edge of the area, is favorable for the occurrence of stratabound copper and silver deposits. The northern drainages have a moderate to high potential for gold in placer deposits in Quaternary sediments and Tertiary gravels. Mesothermal veins occur in a favorable geologic environment containing intrusive rocks and highly faulted and fractured zones. No energy resources are known, and the area is regarded as having low energy resource potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

_____ in press, b, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-F, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

MOUNT HENRY (1-666)

Kind and amount of data

Mineral survey completed (Van Loenen and others, 1983).

Mining districts, mines, and mineral occurrences

No mines or prospects are within the roadless area although several prospects and a few productive mines are located adjacent to the area.

Commodities

Copper, silver.

Mineral resource potential

The southwest edge of the study area has moderate resource potential for copper and silver in low grade stratabound deposits in the Revett Formation of Proterozoic age. A favorable stratigraphic zone within the Revett contains anomalous amounts of copper and silver, but the occurrences are small and the area is assigned low resource potential. The Prichard Formation of Proterozoic age in this area does not contain the zone favorable for Sullivan-type zinc-lead-silver deposits. No energy resources are known; oil and gas potential rated low to zero by Perry and others (1983).

References

Bankey, Viki, Kleinkopf, M. D., and Hoover, Donald, 1983, Geophysical studies of the Mount Henry Roadless Area, Lincoln County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1534-C, scale 1:50,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Siems, D. F., Leinz, R. W., Van Loenen, R. E., Wadsworth, Gail, and McDougal, C. M., 1983, Reconnaissance geochemical map of the Mount Henry Roadless Area, Lincoln County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1534-B, scale 1:50,000.

Van Loenen, R. E., 1983, Geologic map of Mount Henry Roadless Area, Lincoln County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1534-A, scale 1:50,000.

Van Loenen, R. E., Siems, D. F., Bankey, Viki, and Conyac, M. D., 1983, Mineral resource potential map of the Mount Henry Roadless Area, Lincoln County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1534-D, scale 1:50,000.

GRIZZLY PEAK (1-667)
RODERICK MOUNTAIN (1-684)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Harrison, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study areas lie just outside the boundaries of the Yaak district and contain no significant mines, prospects or workings.

Commodities

None known.

Mineral resource potential

These areas have low mineral and energy resource potential. The upper Prichard and the Burke and Revett Formations of the Belt Supergroup occur in the study area but do not contain stratigraphic zones favorable for stratabound deposits. Oil and gas potential is very low to zero throughout the area.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

GOLD HILL (1-668)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Harrison, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

Minor traces of copper.

Mineral resource potential

The area has low mineral and energy resource potential. Minor amounts of stratabound copper occur in the upper Prichard and Burke Formations of the Belt Supergroup.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

CABINET FACE WEST (1-670)
CHIPPEWA CREEK (1-682)

Kind and amount of data

Mineral survey completed (U.S. Geological Survey and U.S. Bureau of Mines, 1981).

Mining districts, mines, and mineral occurrences

The study areas are surrounded by mines, workings, and widespread evidence of mineralization. There are no districts situated within the study areas.

Commodities

None known.

Mineral resource potential

The areas have low potential for mineral and energy resources. Much of the area is covered with gravels, the Striped Peak Formation (Proterozoic), and granodiorite-monzonite stocks. Oil and gas potential rated zero to low by Perry and others (1983).

References

- Gibson, R., 1948, Geology and ore deposits of the Libby quadrangle, Montana: U.S. Geological Survey Bulletin 956, 131 p.
- Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.
- U.S. Geological Survey and U.S. Bureau of Mines, 1981, Mineral resources of the Cabinet Mountains Wilderness, Lincoln and Sanders Counties, Montana: U.S. Geological Survey Bulletin 1501, 77 p.

CABINET FACE EAST (1-671)

Kind and amount of data

Mineral survey completed (U.S. Geological Survey and U.S. Bureau of Mines, 1981).

Mining districts, mines, and mineral occurrences

Several mines, claims, and prospects are situated along the western edge of the area and in many of the drainages. There is no record of production from mines within the study area, although much has been mined nearby. The study area lies just west of the Libby district.

Commodities

Lead, zinc, silver, gold.

Mineral resource potential

The study area has low or high potential for the occurrence of metals in vein and placer deposits. The gold placers are in Quaternary sediments in narrow glaciated valleys that drain the east slope of the Cabinet Mountains. The veins are discontinuously arranged along the north-trending Snowshoe fault. Geochemical data outline the favorable area of mineralized rock, which has moderate or high resource potential for lead, zinc, and silver. No energy resources are known; the area is regarded as having low energy resource potential.

References

- Gibson, R., 1948, Geology and ore deposits of the Libby Quadrangle, Montana: U.S. Geological Survey Bulletin 956, 131 p.
- Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.
- U.S. Geological Survey and U.S. Bureau of Mines, 1981, Mineral resources of the Cabinet Mountains Wilderness, Lincoln and Sanders Counties: U.S. Geological Survey Bulletin 1501, 77 p.

GOVERNMENT MOUNTAIN (1-673)

Kind and amount of data

Information on geology and mineral deposits in part of the area is adequate for a preliminary mineral resource evaluation (U.S. Geological Survey and U.S. Bureau of Mines, 1981), but is not sufficient in any part of the area for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. Data in most of the area is limited.

Mining districts, mines, and mineral occurrences

The Spar Lake copper-silver mine is a few miles to the west, and exploratory drilling in the Cabinet Mountains Wilderness and in the adjacent study area has revealed an extensive deposit of copper and silver. Several prospects and workings within the area have substantiated mineral resources.

Commodities

Copper, silver.

Mineral resource potential

Several square miles along the northeastern edge of the area have moderate to high resource potential for copper and silver in stratabound deposits. The mineralized rock extends into the adjacent Cabinet Mountains Wilderness. The deposits are in quartzite beds of the Revett Formation (Proterozoic). No energy resources are known.

References

Gibson, R., 1948, Geology and ore deposits of the Libby quadrangle, Montana: U.S. Geological Survey Bulletin 956, 131 p.

U.S. Geological Survey and U.S. Bureau of Mines, 1981, Mineral resources of the Cabinet Mountains Wilderness, Lincoln and Sanders Counties, Montana: U.S. Geological Survey Bulletin 1501, 77 p.

LONE CLIFF SMEADS (1-674)
E. FORK ELK CREEK (1-678)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No mining districts, prospects or workings lie within the study areas although the Libby district lies to the northeast, along with many prospects and mines.

Commodities

Minor silver and lead.

Mineral resource potential

The southern border of the Lone Cliff Smeads study area has a moderate potential for metals in mesothermal vein deposits in the Belt Supergroup rocks. No energy resources are known; the areas are assigned low energy resource potential.

References

Gibson, R., 1948, Geology and ore deposits of the Libby quadrangle, Montana: U.S. Geological Survey Bulletin 956, 131 p.

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, Resource appraisal map for the placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

McNEELY CREEK (1-675)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No prospects, mines, or districts lie within or around the study area.

Commodities

Silver, lead, zinc.

Mineral resource potential

A moderate potential for metals in mesothermal veins is assigned to an area along McNeely Creek in the southeast part of the study area. The remainder of the area has low mineral and energy resource potential.

References

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

McKAY CREEK (1-676)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a and b), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no placer or lode prospects within the study area known. Numerous mines are located in the Libby district about 5 miles to the northeast.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

There is a moderate resource potential in parts of the study area for metals in placer and mesothermal vein deposits. The placer deposits occur along Swamp Creek in the southern half of the area in Quaternary sediments and Tertiary gravels. The mesothermal vein network lies along the western boundary in a faulted region southeast of Government Mountain. No energy resources are known; oil and gas potential rated zero to low by Perry and others (1983).

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, b, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

GALENA CREEK (1-677)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No significant mining districts are in or around the area; both placer and lode prospects are present; a few of the placers have a history of production.

Commodities

Gold, silver, molybdenum, tungsten, lead, zinc.

Mineral resource potential

Most of the study area has a moderate to high potential for metals in placer, epithermal lode, and mesothermal vein deposits. Small drainages southwest of the area are the site of placer deposits in Quaternary sediments and Tertiary gravels; the source veins are located within the study area. Along the western edge of the area an epithermal silver deposit and a porphyry molybdenum-tungsten deposit in and around a granite-granodiorite stock have been identified. The northeastern and central parts of the study area have moderate resource potential for metals in mesothermal veins in fracture zones in and around intrusive bodies. No energy resources are known, and the area is assigned low energy resource potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

Harrison, J. E., Leach, D. L., Kleinkopf, M. D., and Long, C. L., in press, b, Resource appraisal map for porphyry molybdenum-tungsten, platinum-group metals, and epithermal silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-H, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

CABINET FACE (NORTH) (1-681)

Kind and amount of data

Mineral survey completed (U.S. Geological Survey and U.S. Bureau of Mines, 1981).

Mining districts, mines, and mineral occurrences

The Libby district lies to the southeast of the area and the Troy district to the northwest. Only one very small prospect is known in the area.

Commodities

None known.

Mineral resource potential

The area has low mineral and energy resource potential. Within the Wallace Formation (Proterozoic) along the Savage Lake fault, sparsely mineralized quartz veins have been found. The study area has a zero to low potential for oil and gas (Perry and others, 1983).

References

- Gibson, R., 1948, Geology and ore deposits of the Libby quadrangle, Montana: U.S. Geological Survey Bulletin 956, 131 p.
- Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.
- U.S. Geological Survey and U.S. Bureau of Mines, 1981, Mineral resources of the Cabinet Mountains Wilderness, Lincoln and Sanders Counties, Montana: U.S. Geological Survey Bulletin 1501, 77 p.

TEN LAKES (1-683)

Kind and amount of data

Mineral survey completed (Whipple and others, 1983).

Mining districts, mines, and mineral occurrences

No mining districts are in or around the study area, nor is any mineral production known. However, over one hundred claims and prospects are known within the area.

Commodities

Barite, copper, gold, lead, zinc, silver.

Mineral resource potential

Several areas of moderate or high mineral potential for metals are associated with areas of prospect workings. In the northwest corner of the area, copper, silver, and gold occur in quartz veins hosted by the Purcell Lava (Proterozoic). The southern part of the study area has a moderate potential for lead, zinc, and silver in veins associated with metadiorite sills in Belt rocks. No energy resources are known, and the area is assigned low energy resource potential.

References

Johns, W. M., 1970, Geology and mineral deposits of Lincoln and Flathead Counties, Montana: Montana Bureau of Mines and Geology Bulletin 79, 182 p.

Whipple, J. W., Perry, W. J., Leinz, R. W., Hamilton, M. M., and Avery, D. W., 1983, Mineral resource potential map of the Ten Lakes Wilderness Study Area, Lincoln County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1589-A, scale 1:48,000.

CUBE IRON MOUNTAIN (1-784)
(Also in Lolo National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a,b,c,d), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No mining districts are within or border the study area. Many small prospects and workings are located within the southeastern corner.

Commodities

Copper, silver, lead, molybdenum, gold, tungsten.

Mineral resource potential

There are several regions within the study area that have a moderate potential for metals in a variety of deposit types. The northwestern edge of the area has a moderate potential for copper and silver in stratabound deposits in the siltites of the Revett Formation (Proterozoic), and for metals in mesothermal vein deposits. To the south, there is a moderate potential for gold in placers, silver in epithermal veins, molybdenum in porphyry-type deposits, and metals in mesothermal veins. The porphyry molybdenum deposits are probably the most significant. No energy resources are known, and the area is regarded as having low energy resource potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, b, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

Harrison, J. E., Leach, D. L., Kleinkopf, M. D., and Long, C. L., in press, c, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-F, scale 1:250,000.

_____ in press, d, Resource appraisal map for porphyry molybdenum-tungsten, platinum-group metals, and epithermal silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-H, scale 1:250,000.

CABINET MOUNTAINS WILDERNESS (NF-010)

Kind and amount of data

Mineral survey completed (U.S. Geological Survey and U.S. Bureau of Mines, 1981).

Mining districts, mines, and mineral occurrences

The area contains about 300 mining claims, none patented, that are located within and along the boundary. Exploration by private industry has resulted in the discovery of a major copper-silver ore body partly within the wilderness.

Commodities

Copper, gold, lead, silver, tungsten, zinc.

Mineral resource potential

Five areas within the wilderness have moderate or high resource potential for a variety of metals. Along its western edge, the wilderness contains stratabound copper and silver deposits in the Revett Formation, and farther south, gold-bearing quartz veins are along the Rock Lake fault. On the northeastern border, low-level silver anomalies found in soils indicate a low to moderate potential for silver. The east-central part, mainly in RARE II 1-671 (Cabinet Face East), has a high potential for lead, zinc, silver in veins along the Snowshoe fault, and the southeast edge has a moderate potential for gold in quartz veins. Oil and gas potential is rated zero to low (Perry and others, 1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

U.S. Geological Survey and U.S. Bureau of Mines, 1981, Mineral resources of the Cabinet Mountains Wilderness, Lincoln and Sanders Counties, Montana: U.S. Geological Survey Bulletin 1501, 77 p.

LEWIS AND CLARK NATIONAL FOREST

TRACTS ADJOINING BOB MARSHALL AND SCAPEGOAT WILDERNESSES (1-485)
(Clearwater-Monture, Deep Creek, Great Bear, including Great Bear Wilderness,
Renshaw Mtn., Silver King-Falls Creek, Swan)
(Also in Flathead, Helena, Kootenai, and Lolo National Forests)

Kind and amount of data

Mineral survey completed except for the Swan Range and tracts northeast of Great Bear Wilderness and east of Scapegoat Wilderness (Mudge and others, 1974, 1978, 1982; Perry and others, 1983).

Mining districts, mines, and mineral occurrences

Exploration for base and precious metals has taken place locally on the south and west sides, but no mineral production is known. The Heddleston district is a few miles southeast of the area. Producing oil and gas fields are east of the area.

Commodities

Oil, gas, copper, silver, lead, zinc, gold, iron, titanium, and molybdenum.

Mineral resource potential

The eastern part of 1-485 has moderate or high potential for oil and gas. The potential decreases southward from high, adjacent to the Great Bear and Bob Marshall, to moderate, adjacent to the Scapegoat, because of the increasing abundance of intrusive igneous rocks. Oil and gas potential on the southwest and west sides of the wildernesses is considered low because favorable traps are buried to as much as 30,000 ft beneath thrust sheets of Proterozoic strata.

Several parts of the RARE II area (patterned on plate 1) have low to high resource potential for non-fuel minerals:

- A. Copper and silver in stratabound occurrences. High potential.
- B. Base metals and silver in veins in carbonate rocks at contact with diorite sills. Moderate potential.
- C. Copper and silver in stratabound occurrences at the Susan Mine. No production. Moderate potential.
- D. Copper and silver in a 15-mile-long quartz-calcite vein stockwork. High potential.
- E. Titanium and iron minerals (ilmenite and magnetite) in paleo-placers in Mesozoic sandstones. Low potential.
- F. Geochemical anomalies of molybdenum, lead, and zinc in the east-central part are associated with areas regarded as having low resource potential for these commodities. Coal is known locally in the northeastern part of the area, but it has low resource potential.

References

- Earhart, R. L., Grimes, D. J., Leinz, R. W., and Marks, L. Y., 1977, Mineral resources of the proposed additions to the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana: U.S. Geological Survey Bulletin 1430, 62 p.
- Mudge, M. R., Earhart, R. L., Kleinkopf, M. D., Rice, D. D., Claypool, G. E., and Marks, L. Y., 1978, Mineral resources of the Bob Marshall Wilderness and study area, Lewis and Clark, Teton, Pondera, Flathead, Lake, Missoula, and Powell Counties, Montana: U.S. Geological Survey Open-File Report 78-295, 268 p.
- Mudge, M. R., Earhart, R. L., and Marks, L. Y., 1982, Mineral resource potential of the Reservoir-North and Deep Creek Roadless Areas, Teton County, Montana: U.S. Geological Survey Open-File Report 82-988, 13 p.
- Mudge, M. R., Earhart, R. L., Watts, K. C., Tuckek, E. T., and Rice, W. L., 1974, Mineral resources of the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana, with a section on Geophysical surveys, by Donald L. Peterson: U.S. Geological Survey Bulletin 1385-B, 82 p.
- Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

CRAZY MOUNTAINS (1-541)
(Also in Gallatin National Forest)
BOX CANYON (1-742)
(Also in Gallatin National Forest)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation in 1-742 and the northern two-thirds of 1-541 (M. W. Reynolds, oral commun., 1984), but is not sufficient in these areas for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. Information on geology and mineral deposits is not adequate for even a preliminary resource evaluation in the southern one-third of 1-541.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The study areas have a low or unknown potential for metals and energy resources. The geologic setting is unfavorable for resources; laccoliths have intruded the Livingston Formation.

References

Larsen, Simms, 1972, Igneous geology of the Crazy Mountains, Montana--A report in progress: Montana Geological Society, 21st Annual Geologic Conference 1972, p. 135-139.

Weed, W. H., 1899, Geology of the Little Belt Mountains: U.S. Geological Survey Geologic Atlas of the United States, Folio 56, scale 1:250,000.

SAWTOOTH (1-721)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Mudge and others, 1974, 1978), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Producing oil and gas fields are east of the area. No mineral occurrences were investigated in the study area.

Commodities

Oil and gas.

Mineral resource potential

The study area has a moderate potential for oil and gas. The structural traps of the area are similar to those in Alberta's producing fields that extend beneath the Lewis Thrust sheet. Other energy and mineral resources are unknown, and their potential is regarded as low.

References

Earhart, R. L., Grimes, D. J., Leinz, R. W., and Marks, L. Y., 1977, Mineral resources of the proposed additions to the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana: U.S. Geological Survey Bulletin 1430, 62 p.

Mudge, M. R., Earhart, R. L., Kleinkopf, M. D., Rice, D. D., Claypool, G. E., and Marks, L. Y., 1978, Mineral resources of the Bob Marshall Wilderness and study area, Lewis and Clark, Teton, Pondera, Flathead, Lake, Missoula, and Powell Counties, Montana: U.S. Geological Survey Open-File Report 78-295, 268 p.

Mudge, M. R., Earhart, R. L., and Marks, L. Y., 1982, Mineral resource potential of the Reservoir-North and Deep Creek Roadless Areas, Teton County, Montana: U.S. Geological Survey Open-File Report 82-988, 13 p.

Mudge, M. R., Earhart, R. L., Watts, K. C., Tuckek, E. T., and Rice, W. L., 1974, Mineral resources of the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana, with a section on Geophysical surveys by Donald L. Peterson: U.S. Geological Survey Bulletin 1385-B, 82 p.

TENDERFOOT/DEEP CREEK (1-726)

Kind and amount of data

Information on geology and mineral deposits is not adequate for a preliminary resource evaluation for the western three-fourths of area. For the eastern one-fourth, information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No claims, prospects, or districts lie within or adjacent to the study area.

Commodities

None known.

Mineral resource potential

The study area has low or unknown potential for mineral resources. The geologic setting is unfavorable; no intrusive rocks are present. Energy resources are unknown, and their potential is regarded as low.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report 1898-99, Part III, p. 257.

Weed, W. H., and Pirsson, L. V., 1899, Economic geologic sheets of the Little Belt Mountains, Montana: U.S. Geological Survey Geologic Atlas of the United States, Folio 56, scale 1:250,000.

PILGRIM CREEK (1-727)

Kind and amount of data

For most of the area, information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. Data are limited in the western part of the area.

Mining districts, mines, and mineral occurrences

The study area lies within the Monarch district which includes Thunder Mountain and the Pilgrim Creek drainage. There are a few small prospects, none of which have recorded production.

Commodities

Iron, gold, silver.

Mineral resource potential

The study area contains two small areas of moderate resource potential. The Thunder Mountain region contains lenses of iron-bearing rock of low industrial grade. Prospects in the Pilgrim Creek valley have trace amounts of gold and silver. Mineralization occurs where porphyritic granite is in contact with sedimentary rocks. Energy resources are unknown and the area is regarded as having low potential.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report 1898-99, Part III, p. 257.

PAINE GULCH (1-728)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two mining districts lie adjacent to the northwestern edge of the study area. A few mines and prospects along the northern boundary have been investigated.

Commodities

Lead, silver

Mineral resource potential

The northeastern part of the area has moderate potential for lead and silver; the mineral resource potential of the rest of the area is low. Northeast of Paine Gulch, lead and silver occur at the contact between the Barker Porphyry and Mississippian sedimentary rocks. Energy resources are unknown, and their potential is regarded as low.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report 1898-1899, Part III, p. 257.

Witkind, I. J., 1971, Geologic Map of the Barker Quadrangle, Judith Basin and Cascade Counties, Montana: U.S. Geological Survey Geologic Quadrangle Map GQ-898, scale 1:62,500.

SAWMILL CREEK (1-729)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are several mining districts adjacent to the area; one, the Barker district, extends into the eastern edge of the area. The study area has scattered mines and prospects throughout although records and data are limited.

Commodities

Lead, silver, gold.

Mineral resource potential

The eastern edge of the study area has moderate to high resource potential for lead, silver, and gold. The mineralized area has a favorable geologic environment; Tertiary intrusives are in contact with Paleozoic carbonates. Energy resources are unknown, and the area is assigned low resource potential.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report 1898-1899, Part III, p. 257.

Witkind, I. J., 1971, Geologic Map of the Barker Quadrangle, Judith Basin and Cascade Counties, Montana: U.S. Geological Survey Geologic Quadrangle Map GQ-898, scale 1:62,500.

TW MOUNTAIN (1-730)
GRANITE MOUNTAIN (1-732)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None.

Commodities

None known.

Mineral resource potential

The mineral and energy resource potential of these areas is regarded as low because of their unfavorable geologic setting. No energy resources are known.

BIG BALDY (1-731)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Four mining districts are within or adjacent to the study area. The many small mines and prospects scattered throughout the area have only minor recorded production.

Commodities

Copper, silver, gold, molybdenum.

Mineral resource potential

Two areas within the study area have moderate to high potential for gold and silver. The southeastern area is within the Yogo district and contains placer deposits and silver and gold veins. The southwestern area is on the edge of the Neihart district. Metals occur in altered limestones in contact with rocks of the Yogo stock and Barker Porphyry. No energy resources are known, and the energy resource potential is regarded as low.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report 1898-1899, Part III, p. 257.

TOLLGATE-SHEEP MOUNTAIN (1-733)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Yogo district is adjacent to the western edge of the study area, where numerous mines, claims, and prospects dot the area.

Commodities

Silver, gold

Mineral resource potential

Two small areas (north of Bandbox Mountain (west-central region) and west of Woodhurst Mountain (northeastern edge)) have moderate to high potential for gold and silver in lode deposits. Silver and gold occur in altered limestones in contact with the Yogo stock. Energy resources are unknown, and their potential is regarded as low.

References

Weed, W. H., 1899, Description of the Little Belt Mountains, Montana: U.S. Geological Survey Geological Atlas, Folio 56, Map, scale 1:250,000.

MIDDLE FORK OF THE JUDITH RIVER (1-734)

Kind and amount of data

Mineral survey completed (Reynolds and others, in press).

Mining districts, mines, and mineral occurrences

The Neihart and Barker districts lie 8-10 miles to the northwest and north, respectively, of the study area. Several prospects and claims are located within the study area. An area on the eastern boundary of the area was once a principal source of sapphires.

Commodities

Silver, lead, copper, gold

Mineral resource potential

The study area is assigned a low mineral resource potential. It contains some small deposits and several prospects. Along the north and west border of the area, a number of claims were investigated and found to contain trace amounts of silver, lead, copper, and gold. The occurrence of sapphires in other parts of the study area is possible but highly unlikely. Oil and gas potential is rated low in the northeast to low to zero in the southwestern part of area (Perry and others, 1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Reynolds, M. W., Kleinkopf, M. D., Hamilton, Michael, and Mayerle, Ronald, in press, Mineral resource potential map of the Middle Fork of the Judith River Wilderness Study Area, Judith Basin and Cascade Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1641-A.

MOUNT HIGH (1-735)
BLUFF MOUNTAIN (1-740)
SPRING CREEK (1-741)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The potential for metal and energy resources is regarded as low due to unfavorable geology. The areas consist of Paleozoic and Mesozoic sediments with no intrusive rocks, hydrocarbon traps, or source rocks for oil and gas.

References

Weed, W. H., 1899, Economic geology sheets of the Little Belt Mountains, Montana: U.S. Geological Survey Geologic Atlas of the United States, Folio 56, scale 1:250,000.

HIGHWOOD-BALDY (1-737)
HIGHWOODS (1-738)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation (M. W. Reynolds, oral commun., 1984).

Mining districts, mines, and mineral occurrences

None.

Commodities

None known.

Mineral resource potential

The study areas have unknown but probably low potential for mineral deposits based on limited information. The geology is unfavorable and consists of a monzonite-syenite intrusive with numerous basaltic sills and dikes radiating from its center. Energy resources are unknown, and their potential is assumed to be low.

References

Weed, W. H., 1899, Description of the Fort Benton quadrangle, Montana: U.S. Geological Survey Geological Atlas, Folio 55, map, scale 1:250,000.

BIG SNOWIES (1-739)

Kind and amount of data

Mineral survey completed (Lindsey and others, 1982; Perry and others, 1983; Desborough and others, 1981).

Mining districts, mines, and mineral occurrences

There are no patented claims and no reported production in the area for metals or oil and gas.

Commodities

Copper, lead, zinc, vanadium, oil, and gas.

Mineral resource potential

The mineral and energy potential of the area is low. Most of the possible source rocks or reservoir rocks in the area are exposed on the limb of an anticline; any hydrocarbons would have escaped to the surface. A metalliferous shale unit crosses the south edge of the area and needs further study. No energy resources are known.

References

Desborough, G. A., Poole, F. G., and Green, G. N., 1981, Metalliferous oil shales in central Montana and northeastern Nevada: U.S. Geological Survey Open-File Report 81-121, 14 p.

Lindsey, D. A., 1980, Reconnaissance geologic map and sections of the Big Snowies Wilderness and contiguous RARE II study areas, Fergus, Golden Valley, and Wheatland Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1243-A, scale 1:100,000.

Lindsey, D. A., Federspiel, F. E., and Huffsmith, J. D., 1982, Mineral potential of the Big Snowies Wilderness and contiguous RARE II study areas, Fergus, Golden Valley, and Wheatland Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1243-E, scale 1:100,000.

Long, C. L., 1981, Complete Bouguer gravity map of the Big Snowies Wilderness and contiguous RARE II study areas, Fergus, Golden Valley, and Wheatland Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1243-C, scale 1:100,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

CASTLE MOUNTAINS (1-743)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984; Winters, 1968), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The eastern one-third of the study area lies completely within the Castle Mountain district. Many mines and prospects along with five patented claims are located along the eastern edge.

Commodities

Copper, silver, lead, zinc, gold.

Mineral resource potential

The northwestern and southeastern corners of the study area, in the Castle Mountain district, have moderate to high mineral potential for base and precious metals. Mineralization took place in granite at contacts with Paleozoic sediments and formed hydrothermal deposits. No energy resources are known, and the area is assigned low potential.

References

Winters, A. S., 1968, Geology and ore deposits of the Castle Mountain Mining District, Meagher County, Montana: Montana Bureau of Mines and Geology Bulletin 64, 64 p.

NORTH FORK OF SMITH CREEK (1-744)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (M. W. Reynolds, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

None known.

Commodities

None known.

Mineral resource potential

The study area has a low potential for mineral and energy resources. The geology is unfavorable; no intrusive rocks are known.

References

Weed, W. H., 1899, Geology of the Little Belt Mountains, Montana: U.S. Geological Survey Twentieth Annual Report, 1898-99, Part III, p. 257.

CALF CREEK (1-745)
EAGLE PARK (1-746)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation except for the western part of 1-746 (Weed, 1899), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts. Information for part of 1-746 is not adequate for a preliminary evaluation.

Mining districts, mines, and mineral occurrences

None.

Commodities

None known.

Mineral resource potential

The geology of both areas is generally unfavorable for mineral occurrences. 1-745 and the eastern one-third of 1-746 have low mineral and energy resource potential. The western two-thirds of 1-746 has unknown potential. Rocks consist of Precambrian gneisses and schists, Cambrian and Devonian carbonates, and some Eocene volcanics, mainly basalt. Oil and gas potential is low to zero.

References

Weed, W. H., 1899, Description of the Fort Benton Quadrangle, Montana: U.S. Geological Survey Geological Atlas, Folio 55, map, scale 1:250,000.

BOB MARSHALL WILDERNESS (NF-005)
SCAPEGUAT WILDERNESS (NF-073)

Kind and amount of data

Mineral survey and hydrocarbon survey completed (Mudge and others, 1978).

Mining districts, mines, and mineral occurrences

Two hundred ninety-seven mining claims are located within or adjacent to the wilderness. There is no record of production. Producing oil and gas wells lie to the east.

Commodities

Oil, gas, copper, silver, barite.

Mineral resource potential

The entire eastern part of the wildernesses has a high resource potential for oil and gas. The degree of potential decreases westward and southward due to the increasing depth to the west and igneous activity to the south (Perry and others, 1983).

Non-fuel minerals are in three types of deposits:

1. Copper and silver in quartz-calcite stockwork veins; different areas range from low to high potential.
2. Copper and silver in stratabound occurrences in "green beds" of Precambrian rocks - generally low potential.
3. A barite vein in the center of the Bob Marshall Wilderness contains an identified resource of about 100,000 tons of barite.

References

Earhart, R. L., Grimes, D. J., Leinz, R. W., and Marks, L. Y., 1977, Mineral resources of the proposed additions to the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana: U.S. Geological Survey Bulletin 1430, 62 p.

Mudge, M. R., Earhart, R. L., Kleinkopf, M. D., Rice, D. D., Claypool, G. E., and Marks, L. Y., 1978, Mineral resources of the Bob Marshall Wilderness and study area, Lewis and Clark, Teton, Pondera, Flathead, Lake, Missoula, and Powell Counties, Montana: U.S. Geological Survey Open-File Report 78-295, 268 p.

Mudge, M. R., Earhart, R. L., and Marks, L. Y., 1982, Mineral resource potential of the Reservoir-North and Deep Creek Roadless Areas, Teton County, Montana: U.S. Geological Survey Open-File Report 82-988, 13 p.

Mudge, M. R., Earhart, R. L., Watts, K. C., Tuckek, E. T., and Rice, W. L., 1974, Mineral resources of the Scapegoat Wilderness, Powell and Lewis and Clark Counties, Montana, with a section on Geophysical surveys, by Donald L. Peterson: U.S. Geological Survey Bulletin 1385-B, 82 p.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

LOLO NATIONAL FOREST

McGREGOR THOMPSON (L1-LAQ)

(See description under Kootenai National Forest)

STEVENS PEAK (1-142)
ROLAND POINT (1-146)
WONDERFUL PEAK (1-152)
(all partly in Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a and b), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study areas are within the Coeur d'Alene district. Many significant mines and prospects are just outside the area, but only a few placer prospects are known in the area.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

Parts of the study areas have a moderate potential for base and precious metals in placers and in mesothermal veins. The gold placers occur in Quaternary sediments and Tertiary gravels in narrow glaciated valleys. The mesothermal vein deposits are associated with an intense fracture zone that trends through the central part of the Coeur d'Alene district. No energy resources are known; the areas are assigned low energy resource potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal maps for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, b, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

HOODOO (1-301)
BURDETTE (1-803)
GARDEN POINT (1-809)

Kind and amount of data

Information on geology and mineral deposits not adequate for a preliminary resource evaluation (J. E. Harrison, oral commun., 1984).

Mining districts, mines, and mineral occurrences

Unknown.

Commodities

Unknown.

Mineral resource potential

The study areas have unknown mineral and energy resource potential and should be studied further. The Mount Shields and Wallace Formations of the Belt Supergroup are the predominant units in the areas.

MEADOW CREEK-UPPER NORTH (1-302)
(85% in Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a and b), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No significant mining districts are within or around the study area. A few small placer prospects are known in the area.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

Several of the narrow glaciated valleys in the study area have a moderate to high potential for placer gold. The area has a low or moderate potential for mesothermal veins in highly faulted and fractured zones. No energy resources are known.

References

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, a, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-I, scale 1:250,000.

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, b, Resource appraisal maps for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series Map I-1509-E, scale 1:250,000.

SILVER KING (1-424)

(See description under Deerlodge National Forest)

TRACTS ADJOINING BOB MARSHALL AND SCAPEGOAT WILDERNESSES (1-485)

(See description under Lewis and Clark National Forest)

CATARACT (1-665)
(See description under Kootenai National Forest)

MARSHALL PEAK (1-781)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, 1969), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

There are no mining districts or prospects within or adjacent to the study area.

Commodities

None known.

Mineral resource potential

Area has low potential for mineral and energy deposits. Rocks in the area are almost entirely metasedimentary strata of the Missoula Group of the Belt Supergroup. Energy resources are unknown.

References

Harrison, J. E., Reynolds, M. W., Kleinkopf, M. D., and Pattee, E. C., 1969, Mineral resources of the Mission Mountains Primitive Area, Missoula and Lake Counties, Montana: U.S. Geological Survey Bulletin 1261-D, 48 p.

CUBE IRON MOUNTAIN (1-784)
(See description under Kootenai National Forest)

SUNDANCE RIDGE (1-785)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No significant prospects, workings, or mining districts are located within the study area.

Commodities

Gold, silver, lead, zinc.

Mineral resource potential

A moderate resource potential for base and precious metals in mesothermal vein deposits exists along the northeastern boundary of the area where a thrust-fault zone is mineralized. No energy resources are known; the energy resource potential is regarded as low.

References

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

MOUNT BUSHNELL (1-790)
GILT EDGE SILVER CREEK (1-792)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study areas are within the Coeur d'Alene mining district and have scattered prospects and mines throughout.

Commodities

Copper, silver, lead, zinc, gold.

Mineral resource potential

Both of the study areas have a highly favorable geologic environment for the occurrence of a variety of deposits. The central part of Mount Bushnell study area has moderate resource potential for copper and silver in stratabound deposits within the Revett Formation, as does the northern tip of Gilt Edge Silver Creek area. Placer gold deposits are small and concentrated in Quaternary sediments of narrow glaciated valleys. Mesothermal vein deposits are extensive in the Coeur d'Alene district, and a moderate potential for base and precious metals in similar veins exists in highly faulted and fractured areas in both study areas. No energy resources are known; the energy resource potential is regarded as low.

References

Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, a, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-F, scale 1:250,000.

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, b, Resource appraisal maps for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

CHERRY PEAK (1-791)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The southern half of the study area lies within the Coeur d'Alene district. Several placer prospects and workings are scattered throughout the area.

Commodities

Gold, copper, silver, lead, zinc.

Mineral resource potential

Parts of the area have moderate resource potential for base and precious metals. The northern part of the study area contains a favorable stratigraphic zone for stratabound copper and silver deposits. The central part of the area contains two small placer deposits with moderate resource potential. To the south, the Prichard Formation (Proterozoic) cuts through the area and contains stratigraphic zones favorable for the occurrence of Sullivan-type stratabound silver, lead, and zinc deposits. Geologic conditions are favorable for the occurrence of mesothermal veins. No energy resources are known; the area is assigned low energy resource potential.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, b, Resource appraisal map for Sullivan-type stratabound lead-zinc-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-G, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

PATRICKS KNOB-NORTH CUTOFF (1-794)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area lies on the northeastern edge of the Coeur d'Alene mining district. Few prospects and workings are within the area, most mining activity being a short distance to the south.

Commodities

Copper, silver, lead, zinc.

Mineral resource potential

The study area contains geology favorable for the occurrence of stratabound and vein deposits; much of the area has a moderate potential for base and precious metals. The northwestern and central parts of the area have a moderate potential for copper and silver in stratabound deposits and also in mesothermal vein deposits. The stratabound deposits occur in quartzite beds of the Revett Formation (Proterozoic); the veins are concentrated in fault and fracture zones. The southwestern corner has moderate potential for metals in mesothermal vein deposits and also in Sullivan-type stratabound lead, silver, and zinc deposits which occur in argillites and siltites of the Prichard Formation (Proterozoic). No energy resources are known; the energy resource potential is regarded as low.

References

- Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, a, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-F, scale 1:250,000.
- Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, b, Resource appraisal map for Sullivan-type stratabound lead-zinc-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-G, scale 1:250,000.
- Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

SOUTH SIEGELS CUTOFF (1-795)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a and b), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area is on the eastern flank of the Coeur d'Alene district, and just south of the area are many prospects and mines. No prospects are known in the study area.

Commodities

Copper, silver, lead, zinc.

Mineral resource potential

Three regions within the study area contain a moderate potential for metals in two types of stratabound deposits and in mesothermal vein deposits. Along the northern border, the area is favorable for Sullivan-type lead, silver, and zinc stratabound deposits in argillites and siltites of the Prichard Formation (Proterozoic), and for mesothermal vein networks associated with fault zones and intrusives. The southern part of the study area contains a moderate resource potential for copper and silver in stratabound deposits in the quartzite beds of the Revett Formation (Proterozoic). No energy resources are known; the energy resource potential is regarded as low.

References

Harrison, J. E., in press, a, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-F, scale 1:250,000.

Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, b, Resource appraisal map for Sullivan-type stratabound lead-zinc-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-G, scale 1:250,000.

NORTH SIEGEL (1-796)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a and b), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area contains no mining districts, and no prospects or mines are known.

Commodities

Lead, silver, zinc.

Mineral resource potential

The southwestern part of the study area has a moderate resource potential for lead, silver, and zinc in Sullivan-type deposits and in mesothermal veins. The Sullivan-type deposits are in the black laminated argillites and siltites of the Prichard Formation of the Belt Supergroup. The mesothermal vein deposits are in a highly fractured zone bordering the study area to the southwest. No energy resources are known.

References

Harrison, J. E., Cressman, E. R., Long, C. L., Leach, D. L., and Domenico, J. A., in press, a, Resource appraisal map for Sullivan-type stratabound lead-zinc-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-G, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, b, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

MARBLE POINT (1-798)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The study area contains no mining districts and no prospects or workings.

Commodities

Silver, gold, lead, zinc.

Mineral resource potential

The north-central part of the study area has a moderate resource potential for base and precious metals in mesothermal veins. Geologic, geochemical, and geophysical data are favorable. The energy resource potential is low.

References

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

SHEEP MOUNTAIN STATE LINE (1-799)
(50% in Idaho)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Gold has been produced from placer deposits in the principal drainages. No significant mining districts lie within or around the study area.

Commodities

Gold, silver, lead, molybdenum, tungsten.

Mineral resource potential

Several parts of the study area have moderate resource potential for metals in a variety of deposits. Placer deposits are located in Quaternary sediments and Tertiary gravels of narrow glaciated valleys. The southern tip of the study area has a moderate potential for silver in epithermal deposits and for molybdenum and tungsten in porphyry deposits. Geochemical and geophysical data indicate that the central part has moderate potential for metals in mesothermal veins. The energy resource potential is regarded as low.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal maps for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., and Long, C. L., in press, b, Resource appraisal map for porphyry molybdenum-tungsten, platinum-group metals, and epithermal silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-H, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

STARK MOUNTAIN (1-800)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Harrison and others, in press, a, b, and c), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No significant districts exist in or around the study area. The southern part of the area possibly contains a few small placer prospects.

Commodities

Copper, silver, lead, gold, zinc.

Mineral resource potential

The central part of the study area has a high resource potential for copper and silver in stratabound deposits. The favorable stratigraphic zone lies in the upper McNamara Formation and the basal part of the Empire Formation of the Proterozoic Belt Supergroup, where argillites and siltites are alternately red and green. A moderate potential exists for base and precious metals in mesothermal veins along the northeastern boundary. There is high potential for gold in placers in the southern drainages. No energy resources are known; the energy resource potential is regarded as low.

References

Harrison, J. E., Domenico, J. A., and Leach, D. L., in press, a, Resource appraisal map for placer gold in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-E, scale 1:250,000.

Harrison, J. E., in press, b, Resource appraisal map for stratabound copper-silver deposits in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-F, scale 1:250,000.

Harrison, J. E., Leach, D. L., and Kleinkopf, M. D., in press, c, Resource appraisal maps for mesothermal base- and precious-metal veins in the Wallace 1° x 2° quadrangle, Montana and Idaho: U.S. Geological Survey Miscellaneous Investigations Series I-1509-I, scale 1:250,000.

RATTLESNAKE (1-801)

Kind and amount of data

Mineral survey completed (Wallace and others, 1983).

Mining districts, mines, and mineral occurrences

Numerous claims and prospects have been recorded outside the study area, but only very minor workings were found inside the area. There are no mining districts in or adjacent to the study area.

Commodities

Barite, copper, silver.

Mineral resource potential

One very small region in the study area was identified as having a high resource potential for copper and silver. One low grade stratabound copper and silver deposit was explored, but found to be small and discontinuous. A barite occurrence in the southern part of the roadless area has low resource potential. The area has a low to zero potential for petroleum (Perry and others, 1983).

References

Campbell, W. L., McDaniel, S. K., and Hopkins, R. T., 1981, Analytical results for 130 rock, 135 stream sediment and soil and 110 panned concentrate samples from the Rattlesnake Wilderness study area, Missoula County, Montana: U.S. Geological Survey Open-File Report 81-1219, 32 p.

Kulik, Dolores M., 1983, Interpreted complete Bouguer gravity and aeromagnetic maps of the Rattlesnake Wilderness study area, Missoula County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1235-B, scale 1:50,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

Wallace, C. A., and Lidke, D. J., 1980, Geologic map of the Rattlesnake Wilderness study area, Missoula County, Montana, U.S. Geological Survey Miscellaneous Field Studies Map MF-1235-A, scale 1:50,000.

Wallace, C. A., Lidke, D. J., Kulik, D. M., Campbell, W. L., Antweiler, J. C., and Mayerle, R. T., 1983, Mineral resource potential map of the Rattlesnake Roadless Area, Missoula County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1235-D, scale 1:50,000.

LOLO CREEK (1-805)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (Toth and others, 1983), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

No mines, prospects, or districts are within the study area although many prospects and mines, including the Cliff mine, lie just to the south of the area.

Commodities

None known.

Mineral resource potential

Mineral and energy resource potential is low. The geology is unfavorable.

References

Coxe, B. W., Mosier, E. L., and McDougal, C. M., 1982, Analyses of rocks and stream sediments from the Selway-Bitterroot Wilderness Area, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey report: available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, as Report PB 82-253386.

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Koesterer, M. E., Bartel, A. J., Elsheimer, H. N., Baker, J. W., King, B. S., and Espos, L. F., 1982, Major-element XRF spectroscopy analyses from the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Open-File Report 82-1023, 36 p.

Toth, M. I., 1983, Reconnaissance geologic map of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-B, scale 1:125,000.

Toth, M. I., Coxe, B. W., Zilka, N. T., and Hamilton, M. M., 1983, Mineral resource potential of the Selway-Bitterroot Wilderness, Idaho County, Idaho, and Missoula and Ravalli Counties, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1495-A, scale 1:125,000.

Zilka, N. T., and Hamilton, M. M., 1982, Mineral investigation of the Selway-Bitterroot Wilderness, Idaho County, Idaho and Missoula and Ravalli Counties, Montana: U.S. Bureau of Mines Mineral Land Assessment Report MLA 102-82, 14 p.

WELCOME CREEK (1-806)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984; Lidke and others, 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two small mining districts are adjacent to the study area. No mines or prospects are known in the study area.

Commodities

Gold.

Mineral resource potential

A moderate potential for gold was assigned to the eastern edge of the area where small placer deposits occur in Quaternary and older terrace gravels. Oil and gas resource potential is low to zero (Perry and others, 1983).

References

Lidke, D. J., Wallace, C. A., Close, T. J., Antweiler, J. C., Campbell, W. L., Hassemer, J. H., and Hanna, W. F., 1984, Mineral resource potential map of the Welcome Creek Wilderness, Granite County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1620-A, scale 1:50,000.

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

QUIGG PEAK (1-807)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

Two small mining districts are adjacent to the study area, and two significant prospects are within the area.

Commodities

Molybdenum, gold, barite.

Mineral resource potential

Two parts of the study area have moderate to high mineral resource potential. The Chico Gulch prospect is located in the central part of the study area; low-grade molybdenum in quartz veins occurs in altered quartzite. The Miners Gulch prospect is in the southeast corner of the area and has both placer and lode deposits. The placer deposits are found in Quaternary gravels and older terrace gravels. Lode deposits occur as veins with barite and gold. A moderate potential for molybdenum in a porphyry-type deposit also exists in the Miners Gulch area. Energy resources are unknown; petroleum potential is rated zero (Perry and others, 1983).

References

Perry, W. J., Rice, D. D., and Maughan, E. K., 1983, Petroleum potential of Wilderness Lands in Montana: U.S. Geological Survey Circular 902-G, 23 p., and Miscellaneous Investigations Series Map I-1541, scale 1:1,000,000.

STONY MOUNTAIN (1-808) (L1-BAD)
(Also in Bitterroot and Deerlodge National Forests)

Kind and amount of data

Information on geology and mineral deposits is adequate for a preliminary mineral resource evaluation (J. E. Elliott, oral commun., 1984), but is not sufficient for the mineral surveys as required by the Wilderness Act (PL88-577) and related acts.

Mining districts, mines, and mineral occurrences

The Rock Creek district extends across the eastern edge of the study area. Mines and prospects are scattered throughout the area.

Commodities

Gold, silver, copper, vermiculite, sapphires.

Mineral resource potential

Two parts of these areas have moderate to high potential for a variety of commodities. To the east, the Rock Creek district contains placer gold deposits in Tertiary gravels and lode vein deposits in Precambrian metasediments and volcanics. To the southwest, at Skalkaho Mountain, a vermiculite deposit is being actively explored. The vermiculite occurs in a complex Mesozoic intrusive composed of pyroxenite and syenite. Energy resource potential is low.

WELCOME CREEK WILDERNESS (NF-103)

Kind and amount of data

Mineral survey completed (Lidke and others, in press).

Mining districts, mines, and mineral occurrences

Numerous placers are scattered throughout the area, and some have been prospected. Welcome Creek mining district extends into the area.

Commodities

Gold, silver.

Mineral resource potential

The wilderness has a moderate to high potential for gold in placer deposits along Welcome Creek and Rock Creek. The Cleveland Mountain area has a moderate resource potential for gold and silver in veins; little production has been recorded. The northeast part of the area contains green mudstones that elsewhere are favorable hosts for stratabound copper deposits, but there is little promise for such deposits in this area. The energy resource potential is regarded as low.

References

Close, T. J., 1982, Mineral resources of the Welcome Creek Wilderness, Granite County, Montana: U.S. Bureau of Mines Open-File Report MLA 17-82, 14 p.

Hassemer, J. H., 1981, Principal facts and complete Bouguer gravity anomaly map for the west half of the Butte 1° by 2° quadrangle, Montana: U.S. Geological Survey Open-File Report 81-949, 39 p.

Lidke, D. J., Wallace, C. A., Close, T. J., Antweiler, J. C., Campbell, W. L., Hassemer, J. H., and Hanna, W. F., 1984, Mineral resource potential map of the Welcome Creek Wilderness, Granite County, Montana: U.S. Geological Survey Miscellaneous Field Studies Map MF-1620-A, scale 1:50,000.

Lyden, C. J., 1948, The gold placers of Montana: Montana Bureau of Mines and Geology Memoir 26, v. 15, 99 p.

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